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BURNS'S
OBSTETRICAL WORKS.

THE ANATOMY
OF THE
GRAVID UTERUS;
WITH PRACTICAL INFERENCES RELATIVE TO PREGNANCY AND LABOUR.

OBSERVATIONS
ON
ABORTION;
CONTAINING AN ACCOUNT OF THE MANNER IN WHICH IT TAKES PLACE; THE CAUSES WHICH PRODUCE IT; AND THE METHOD OF PREVENTING OR TREATING IT.

PRACTICAL OBSERVATIONS
ON THE
UTERINE HEMORRHAGE;
WITH REMARKS ON THE MANAGEMENT OF THE PLACENTA.

BY JOHN BURNS,
LECTURER ON MIDWIFERY, AND MEMBER OF THE FACULTY OF PHYSICIANS AND SURGEONS IN GLASGOW.

THREE VOLUMES IN ONE.

NEW-YORK:
PUBLISHED AND SOLD BY COLLINS AND PERKINS,
Printers and Importers of Medical Books to the College of Physicians
and Surgeons in New-York, and to the New-York Hospital.
1809.

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ADVERTISEMENT,

By the American Publishers.

THE Publishers presume to exhibit claims upon the Medical Profession for their patronage of the three Treatises comprised in this volume; and which are grounded on the following improvements:

FIRST, The great reduction of the *price*, which is about one fourth of the cost of the imported volumes:

SECONDLY, The correction of a very long list of *typographical errors*. Many of these materially affected the sense, and were much complained of by the different reviewers. The writers in the *Annual Review* have these remarks:

> "The pleasure which we have experienced in its [the Treatise on Abortion] perusal, has been materially affected by the very inaccurate manner in which it is printed. Some of the errors are of serious magnitude; and although they are for the most part noticed in a list of errata, at the end of the work, yet we fear that many persons may see the faulty passages, who do not see the correction of them."

The writers in the *Edinburgh Medical and Surgical Journal*, make a similar complaint; and especially state that all the errors are not noticed in the list given by the author*. This is indeed the fact; and the present publishers, partly through the aid of a respectable medical friend, have detected and corrected above *one hundred* of this description!

---

* An Edition of the Treatise on Abortion has been printed at Troy, (N. Y.) in which, not only all the errors unnoticed in the author's list are copied, but even those mentioned in it; the printer not appearing to have known that a list of errata was given in the London edition! The reader of the Troy edition, therefore, has not the advantage possessed by the reader of the London copy, for this did point out *some* of the errors.

A THIRD improvement consists in the introduction of a TABLE OF CONTENTS, which will be found useful in guiding the reader to any of the subjects discussed in the three treatises. It is singular that nothing of this kind was introduced into the London edition.

A further improvement might have been made, had it occurred to the publishers in season. The three being originally published as distinct works, no attention was paid to any particular arrangement of them in this volume: but there would, perhaps, have been a propriety in placing the treatise on the Anatomy of the Gravid Uterus first; and the two others in the order in which they are now introduced. This arrangement it is thought proper to adopt in the title page. The Table of Contents, by exhibiting to the view of the reader the pages in which the various subjects are treated, will remove the inconvenience, should any arise from the order in which the works are inserted.

Annexed are characters of these treatises given in four different reviews. Perhaps no medical works have issued from the press, in Great-Britain, for many years, which have met with a more favourable reception.

Of the Treatise on the Anatomy of the Gravid Uterus.

" Mr. BURNS has rendered an essential service to professional men in the execution of this work, which, with the anatomical description of the Uterus, by the late celebrated Dr. William Hunter, forms a complete system of the Anatomy of that viscus, and lays a sure foundation for the obstetric art. The author delivers every circumstance relating to the structure of the Uterus and its appendages in the various stages of pregnancy; and has dispersed in several parts, much judicious physiological reasoning. Throughout the whole, he has been particularly attentive to whatever could, in the least, throw light upon the art of midwifery. The reader will likewise find many important remarks on the pathology of this organ, and its contents during uterogestation."

London Medical Review and Magazine.

Of the Treatise on Abortion.

"The writer of the present work is not unknown to our readers. His *Treatise on the Gravid Uterus* deservedly attracted a considerable share of our notice, as it evinced a minute and extensive acquaintance with the important subject of uterine affections, while the known anatomical and physiological skill of the author, render his observations on subjects of this nature, of more than ordinary value.

"The consideration of the manner in which abortion takes place, of the causes which give rise to it, and of the most likely means of preventing it, or of obviating those unpleasant symptoms which accompany it, must form a subject of very great importance to the medical student. On all these different heads, the author treats with great clearness."

London Medical and Chirurgical Review.

Of the same Work.

"The frequency of the occurrence which forms the subject of this publication, the disappointment which it occasions to the mother in prematurely destroying the life of her offspring; the immediate danger which it induces, and the permanent injury which the constitution receives, all conspire to render it an object deserving the strictest attention of the practitioner. Much has, of course, been written upon so important a subject, and many valuable observations have, at different times, been laid before the public, with a view to its prevention; but the authors have principally contented themselves with dealing out practical remarks, founded upon real or supposed experience, without going so completely into the consideration of the structure and formation of the ovum and uterus, as to point out the origin of that morbid action, which, in the first instance, brings on the tendency to abortion. To accomplish this is the leading object with the author in the work now before us; a task which he is well qualified to undertake, from the minute attention that he is known to have bestowed upon the anatomy of the uterus, and the changes which it undergoes during the period of gestation."

After a copious analysis of the work, the Reviewers conclude:

"We have, upon the whole, perused this volume with great satisfaction; and must strongly recommend it to the attention of all our medical readers." *Annual Review.*

Of the Treatise on Uterine Hemorrhage.

"This work of Mr. Burns, forms a very natural sequel to his Essay on Abortion. It is one of considerable merit and interest on a subject of undoubted importance; a subject which, in all its details, ought to be constantly and intimately familiar to every general practitioner. For here, there is often no time for delay, nor hesitation. Prompt and decisive measures, such as experience and observation have already sanctioned and determined as rules of practice, may save, while a single error, whether of omission or commission, may in the case of uterine hemorrhage, prove instantly destructive to the patient. This then, is the peculiar merit of Mr. Burns, that his discourse is truly practical, that he has kept steadily to his subject, without distracting his reader's attention, by any idle speculation or foreign discussion, while with a happy perspicuity, he explains in a persuasive and instructive manner, the most efficient and approved practice in the different cases. Nothing, in our opinion, is more praise-worthy in a medical writer than this, of following out a few plain and general principles in a practical discourse, to the exclusion of the too common ornament of fine spun theories, which have no other effect than to obscure the subject.

After a detailed account of the contents of the work, the Reviewers conclude:

"The remaining observations of Mr. Burns on the treatment of hemorrhage occurring during labour, after delivery, and after the expulsion of the placenta, and his directions for the management of the placenta, are equally copious and instructive with those of which we have given this short account. They appear all deducible from the soundest principles of pathology, and agreeably, we believe, to the experience of the most enlightened practitioners."

Edinburgh Medical and Surgical Journal.

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OBSERVATIONS

ON

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ACCOUNT OF THE MANNER IN WHICH IT TAKES PLACE,

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BY JOHN BURNS,

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FROM THE SECOND LONDON EDITION, IMPROVED BY THE
AUTHOR.

NEW-YORK:

PUBLISHED AND SOLD BY COLLINS AND PERKINS.

1809.

TO

THE GENTLEMEN

WHO

ATTENDED THE AUTHOR'S LECTURES

IN THE SESSION

1802—3,

THIS BOOK IS INSCRIBED,

AS A

GRATEFUL AND AFFECTIONATE REMEMBRANCE

OF THE

VERY FLATTERING COMPLIMENT

WHICH THEY

BESTOWED UPON HIM.

ADVERTISEMENT

TO THE SECOND ENGLISH EDITION.

The Author has carefully Revised the present Edition, and has made such Additions and verbal Alterations as will, he hopes, render his Observations and Practical Directions still more definite and precise.

OBSERVATIONS

ON

ABORTION.

BY abortion is generally understood the expulsion of the contents of the gravid uterus, at a period of gestation so early as to render it impossible for the fœtus to live. It is an accident or disease which is very frequent in its occurrence, which is always attended with disagreeable circumstances, and which, although it seldom prove immediately fatal, may yet be productive of much mischief at a future time. The consideration, therefore, of the manner in which it takes place, of the causes which give rise to it, and of the most likely means of preventing it, or of obviating those unpleasant symptoms which accompany it, must form a subject of very great importance to the medical student. But before proceeding to consider these points, it will be necessary to understand the structure and formation of the ovum, which I shall, therefore, first of all explain.

OF THE FORMATION OF THE OVUM.

THE human uterus in the unimpregnated state, consists of a succulent substance in which we may perceive fibres running in every direction. In the interstices of these we find a serous fluid which can easily be squeezed out. By injecting the vessels finely with size or mercury, we observe them to be numerously intermixed with the fibres, but small in their ramifications. A portion of these vessels follows an irregular course toward the inner surface or cavity of the uterus, and opens there upon the membrane which lines it. At the menstrual period, the vessels enlarge or dilate a little, and their orifices become more distinct over the surface of the cavity, as may be ascertained by inspecting those who have died at that time.—Sometimes a slight temporary serous secretion precedes the flow of the menses, and succeeds it. More frequently the vessels yield a bloody fluid at once, which continues to be discharged for a certain number of days.

When impregnation takes place, the vessels enlarge speedily and distinctly. We can observe small trunks forming in the substance of the uterus, the largest of which are to be found at the two sides where the spermatic and hypogastric branches meet. Both arteries and veins enlarge, but the latter are most conspicuous. Even before the embryo has descended into the uterus, and whilst the viscus itself is not materially enlarged, the venous system has assumed the appearance of sinuses, each principal branch being larger than the barrel of a goose quill. The old fibres are more separated, and new ones are added, especially at the fundus. The quantity of interstitial fluid is increased, so that the uterus becomes manifestly softer, and from the enlargement of the veins, it soon assumes a doughy feel. The vessels, as they enlarge, tend to the uterine cavity, but instead of opening there, and yielding a fluid, as in menstruation, they either elongate themselves, or which is more probable, form new and very delicate vessels which project from the inner surface of the uterus, giving it an appearance as if covered with down. This takes place first at the orifice of the fallopian tube, and then extends to the fundus, whilst the body remains quite smooth. These vessels project for about a line in length at right angles, from the surface which yields them, and as they consist of arteries and veins, the down or efflorescence which they form, has, after death, a striated appearance; the empty arteries being white, the fuller veins red or black. These vessels constitute the outer layer of the decidua, which may be called decidua striata, although the striæ be obliterated as gestation advances; almost immediately after the formation of these primary vessels, they secrete from their extremities a membrane, or rather an irregular tissue of vessels, which, on account of their origin, may be called secondary. These are very different from the primary, for whilst the latter are short, straight, and parallel to each other, the former are more extended, intermix, and ramify together, so as to form a sheet of vascular substance, which assumes a direction at right angles to the striæ, so that as they thus cross them, it follows that any body coming down through the fallopian tube into the uterus, must, before it can get fully into its cavity, either rupture this vascular sheet, or push it before it. In this last manner it is, that the vesicular ovum enters the cavity of the womb, the vascular web formed by the secondary vessels, or the inner layer of the decidua, being protruded before it, constituting decidua reflexa or protrusa.

Such is the structure of the decidua externa and interna at three weeks after impregnation, and at this period no fœtus is to be found in the uterus. In one case I detected the vesicular ovum in the tube. It was about half way betwixt the two extremities, was rather smaller than a full grown pea, and contained a little fluid. In another case, I found it still in the ovarium, covered by the fimbriated extremity of the tube. By puncturing the peritoneal coat of the gland, the vesicle escaped. When the fœtus does descend into the uterus, it is contained in a double membrane; the internal one is the amnion, and possesses no distinct vessels; the external one is the chorion, and is from the first vascular, and soon becomes so much so, that its vessels have by some been described as forming a distinct tunic.

From what has been said, it will be evident, that when this vesicle does reach the uterus, it will be received among the primary vessels, which will surround it, whilst the secondary vessels or decidua interna will lie before it, and prevent any direct communication betwixt it and the uterine cavity. But it cannot long remain thus, for in proportion as the vesicular part of the ovum increases, it will push the decidua interna before it, and encroach on the cavity of the uterus. This circumstance, together with the intimate connexion formed betwixt the vessels of the chorion, and those of the decidua, with the consequent production of a placenta, I have elsewhere * fully detailed.

When the ovum descends, and the subsequent changes are beginning to take place, the body of the uterus comes also to form decidua; for I have already stated that until the fœtus comes into the uterus, the fundus alone yields this production †. By the extension of this action and the gradual enlargement of the membranes, the whole body comes to be filled up, and the cervix is sealed as it were with a lymphatic or gelatinous plug. By opening the gravid uterus in the end of the second month, we shall find it quite filled up, the placenta and membranes occupying the fundus, the decidua protrusa covering the membranes, and the lower part of the body filled up with vascular substance, or decidua vera as it has been called, extending all the way down to the gelatinous secretion at the cervix.

If at this time we take the ovum out of the uterus, or, if we cut off the face of the uterus, and remove the decidua from the front of the membranes, we shall see at the upper part of the placenta and membranes, like a thick old fashioned watch, the placenta ‡ resembling the case, and the mem-

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* Vide "Anatomy of the Gravid Uterus, with practical inferences relative to Pregnancy and Labour."

† It has been the general opinion since the time of Dr. Hunter, that the decidua extended a little way into the tube, and on his authority I stated this to be the case in an account which I formerly published. By careful examination I am now convinced that this is not the case; my brother, a most accurate anatomist, in his dissections, even thought that the uterine extremity of the tube, was less changed in point of vascularity, than any other part of it.

‡ The placenta, contrary to some plans, is not in general formed ex-

branes the glass of the watch; then, at the lower part of the membranes we see the remains or margins of the decidua protrusa, which has been removed to show the chorion, whilst still lower down, we observe the decidua externa occupying the inferior part of the uterus, forming a short stalk to the flattened sphere above. As the layers of decidua, furnished by the opposite sides of the uterus, do not intermix when they meet in its axis, we may trace a small canal or perforation leading up from cervix uteri to the bottom of the decidua protrusa, and corresponding to the long axis of the uterus. In proportion as the membranes elongate and enlarge, the decidua gradually proceeds before them down this canal, until at last it reaches the bottom; or in other words, the membranes occupy all the uterine cavity.

Now from this general view of the formation of the ovum, it will appear, that very soon after impregnation the circulation in the uterus is considerably augmented, and a progressively increasing action is established; new fibres are daily formed, and very tender and delicate vessels sprout out from the surface. These are so fine, that they much resemble the down which is formed on putrifying meat. But notwithstanding this, they are not only circulating blood regularly, but are also engaged in a powerful action. Whoever considers these circumstances, will be less astonished that rupture should sometimes take place, than that they should ever remain for a week entire, and will be most forcibly struck with the necessity of preventing the blood from being strongly or rapidly propelled into this ten-

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actly at the fundus uteri, stretching equally down on the two faces of the uterus, with the membranes hanging perpendicularly from it. But it lies chiefly on one face of the uterus, most frequently on the posterior face, whilst the membranes are turned to the other. The centre of the membranous bag, therefore, at this early period, is not generally directed to the os uteri, but either to the fore or back part of the uterus. In proportion, however, as the bag enlarges, it also elongates. Its centre or apex descends, and ultimately corresponds with the long axis of the uterus.

der structure. He will consider the great risk of abortion as at first proceeding almost entirely from causes connected with the circulation of the blood, and will perceive the indispensable necessity of preventing plethora, and moderating the action of the vessels, and the strong probability of inducing abortion, when to these general causes are added any of those which particularly operate on the uterus.

When the fœtus has descended, and the fringed vessels of the uterus have come to intermix and communicate with those of the chorion, and especially when about the third month he finds the ovum to be almost a ball, thickly surrounded with innumerable vessels, circulating much blood, and performing strong action, he will without hesitation pronounce that great danger must proceed from a tendency in the vessels to rupture, and that the chief security against this arises from a strict attention to the circulation, and from that care which is requisite in order to preserve the integrity of the vessels.

But this is not the only source of danger. The uterus is greatly influenced in its actions by a variety of circumstances *. The health and existence of the fœtus depend much upon the state of the uterus, and the condition of the vascular involucra; it is, moreover, subject to accidents and diseases proceeding from peculiar affections of its own system, and which bring on an early death.

OF THE MANNER IN WHICH ABORTION TAKES PLACE.

THE process of gestation may be stopped, even before the fœtus, or vesicular part of the ovum, has descended into the uterus, and when only the primary vessels are formed. In this case, which occurs within three weeks

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* Some of these are connected with a state opposite to that in which plethora exists, and will require a different treatment.

after impregnation, the symptoms are much the same with those of menorrhagia. There is always a considerable, and often a copious discharge of blood, which coagulates or forms clots. This is accompanied with marks of uterine irritation, such as pain in the back and loins, frequently spasmodic affections of the bowels, and occasionally a slight febrile state of the system. In plethoric habits, and when abortion proceeds from over-action, or hemorrhagic action of the uterine vessels, the fever is idiopathic, and precedes the discharge.

In other circumstances it is either absent, or when present, it is symptomatic, and still more inconsiderable, arising merely from pain or irritation. As the primary vessels are very small, and are soon displaced, they cannot be detected in the discharge. Nothing but coagulum can be perceived; and this, as in other cases of uterine hemorrhage, is often so firm, and the globules and lymph so disposed, as to give it, more especially if it have been retained for some time about the uterus or vagina, a streaked or fibrous appearance, which sometimes gives rise to a supposition, that it is an organized substance. The discharge does not cease, when the primary vessels are destroyed, but generally continues until the small vesicle passes out of the fallopian tube. Then it stops, and an oosing of serous fluid, finishes the process.

The only interruption to the discharge in this case of abortion, proceeds from the formation of clots, which, however, are soon displaced. Women, if plethoric, sometimes suffer considerably from the profusion of the discharge; but, in general, they soon recover.

When the secondary vessels are formed, the symptoms are still pretty much the same; but if the vesicle has descended into the uterus, they are somewhat different. We have an attempt in the uterus to contract, which formerly was not necessary; we have pains more or less regular in the back and hypogastric region; we have more disturbance of the abdominal viscera, particularly the stomach. The discharge is copious, and small bits of fibrous subtance can often be observed*.

Sometimes, when the vesicle has come into the uterus, before abortion takes place, it may be detected in the first discharge of blood, and will be found to be streaked over with pale vessels, giving it an appearance as if it had been slightly macerated. When all the contents are expelled, a bloody discharge continues for a few hours, and is then succeeded by a serous fluid at this time; and, in later abortion, if the symptoms come on gradually, we may sometimes observe a gelatinous matter to come away before the hemorrhage appears.

In some instances there is no discharge of blood, but the ovum decays and comes away slowly and piece-meal, in a putrid state; and the secretion about the vagina has an offensive smell. If the breasts had been tense they become flaccid and soft, and sometimes a serous and milky fluid runs out at the nipple for several weeks, or even months. The woman feels languid and hot at night, and very frequently hysterical affections supervene. The uterus continues somewhat enlarged, and its orifice soft until all its contents are discharged; nor is the health or spirits re-established until that take place.

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* In some instances, the uterus seems to have the power of forming a vascular substance from its inner surface, although impregnation have not taken place; and, in this case, we may have the symptom of early abortion attending its expulsion. But much oftener we find that this appears as a derangement of the menstrual action, the vessels secreting a semi-organized substance, instead of the usual quantity of bloody fluid; hence, as has been observed by that ingenious and excellent practitioner, Dr. Denman, we have sparing and painful menstruation. Sometimes after this substance is formed, it is expelled with considerable-discharge. A very distinct case of this kind is to be found in the Epistles of Morgagni; a noble matron, after bearing several children, and suffering several abortions, became subject to a new and very troublesome complaint; for at the menstrual period pains like those of labour came on, and there was expelled a triangular membrane, corresponding to the shape of the uterine cavity. The inner surface of this substance was smooth and moist as if it had contained a fluid; the outer was rough and irregular. The exclusion of this was attended with considerable discharge, and was followed by lochia. This continued to be regularly repeated every month, during the unimpregnated state. "She, therefore," adds he, "determined to lie no longer alone, wherefore, in the month of March 1724, she became again pregnant."

EPIST. xlviii. Art. 12.

If the uterus have been filled up, as in the beginning of the third month, the vesicle never escapes first; but we have for some time a discharge of blood, accompanied or succeeded by uterine pain. Then the inferior part or short stalk of the ovum is expelled, gorged with blood, and afterwards the upper part equally injured. Sometimes the whole comes away at once and entire; but this is rare. As considerable contraction is now required in the uterus, the pains are pretty severe. The derangement of the stomach is also greater than formerly, giving rise to sickness or faintness, which is a natural contrivance for abating the hemorrhage.

When the membranes come to occupy more of the uterus, and a still greater difference exists betwixt the placenta and decidua, we have again a change of the process; we have more bearing down pain, and greater regularity in its attack; we have a more rapid discharge, owing to the greater size of the vessels; but there is not always more blood lost now than at an earlier period, for coagula form readily from temporary fits of faintness and other causes, and interrupt the flow until new and increased contraction displaces them. Often the membranes give way, and the fœtus escapes with the liquor amnii, whilst the rest of the ovum is retained for some hours or even days *, when it is expelled with coagulated blood separating and confounding its different parts or layers. At other times the fœtal and maternal portions separate, and the first is expelled before the second, forming a very beautiful preparation. In some rare instances we find the whole ovum expelled entire, and in high preservation. After the expulsion, the hemorrhage goes off, and is succeeded by a discharge somewhat resembling the lochia.

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* In all cases the placenta is retained much longer after the expulsion of the child in abortion, than in labour at the full time.

In cases of twins, after one child is expelled, either alone or with its secundines, the discharge sometimes stops, and the woman continues pretty well for some hours, or even for a day or two, when a repetition of the process takes place, and if she has been using any exertion, there is generally a pretty rapid and profuse discharge. This is one reason, amongst many others, for confining women to bed for several days after abortion.

There is frequently, for a longer or shorter time before the commencement of abortion, a pain and other irregular actions in the neighbouring parts, which give warning of its approach before either discharge or contraction take place *, unless when it proceeds from violence, in which case the discharge may instantly appear. This is the period at which we can most effectually interfere for the prevention of abortion.

I need not be particular in adding, that we are not to confound these symptoms with the more chronic ailments which accompany pregnancy. Similar disturbances in the action of the neighbouring parts are very commonly found to precede labour at the same time; and even then we may, by proper means, postpone or retard expulsion for some hours or days.

A great diversity obtains in different instances with regard to the symptoms and duration of abortion. In some cases the pains are very severe and long continued; in others, short and trifling †. Sometimes the hemorrhage is profuse ‡ and alarming: at other times, although circumstances may not be apparently very different, it is moderate or inconsiderable. Often the sympathetic effects on the

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* In some cases, shooting pains and tension are felt in the breasts before abortion, and the patient is feverish.

† The degree of pain is not always a correct index of the force or degree of contraction.

‡ Those who are plethoric generally lose most blood, unless the contraction have been brisk. In some cases six or seven pounds of blood have been lost in a few hours.

stomach and bowels are scarcely productive of inconvenience, whilst in a greater number of instances they are very prominent symptoms.

I may only add, that, *cæteris paribus*, we shall find, that the farther the pregnancy is advanced beyond the third month, and the nearer it approaches to the end of the sixth, the less chance is there of abortion being accompanied, but the greater of its being succeeded, by nervous affection.

As there is a diversity in the symptoms, so is there also in the duration of abortion: for, whilst a few hours in many, and not above three days in the majority of cases, is sufficient to complete the process, we find other instances in which it is threatened for a long time, and a number of weeks elapse before the expulsion take place.

In some cases the child appears to be dead for a considerable time before the symptoms which accompany expulsion appear. But in a great majority of cases it is living, when the first signs of abortion are perceived, and in some instances is born alive. The signs by which we judge that the child in utero is dead, are the sudden cessation of the morning sickness, or of any other sympathetic symptom which may have been present. The breasts become flaccid. If milk had been formerly secreted, it sometimes disappears, but in other instances the contrary happens, and no evident secretion takes place until the action of gestation, or at least the life of the child be lost. In almost every case, however, the breasts will be found to have lost their firmness. If the pregnancy had advanced beyond the period of quickening, the motion of the child will be lost, and a feeling of heaviness will be felt about the pelvis; when all these signs are observed, and when they are followed by discharge, and especially when this is attended with pain, there can be no doubt that expulsion will take place, and it would be improper to prevent it. We are not, however, to conclude that the child is dead, merely because it does not move, and when abortion is threatened before the term of quickening, this sign does not enter into our consideration.

OF THE CAUSES GIVING RISE TO ABORTION.

ABORTION may very properly be divided into accidental and habitual. The exciting causes of the first class may, in general, be easily detected; those giving rise to the second, are often more obscure; and, without great attention, the woman will go on to miscarry, until either sterility, or some fatal disease, be induced.

In many cases there can be no peculiar pre-disposing cause of abortion; as, for instance, when it is produced by blows, rupture of the membranes, or accidental separation of the decidua: but when it occurs without any very perceptible exciting cause, it is allowable to infer, that some pre-disposing state exists; and this generally consists in an imperfect mode of uterine action, induced by age, former miscarriages, and other causes.

It is well known, that woman can only bear children until a certain age; after which, the uterus is no longer capable of performing the action of gestation, or of performing it properly. Now, it is observable, that this incapability or imperfection takes place sooner in those who are advanced in life, before they marry, than in those who have married and begun to bear children earlier. Thus we find, that a woman who marries at forty, shall be very apt to miscarry; whereas, had she married at thirty, she might have born children when older than forty; from which it may be inferred, that the organs of generation lose their power of acting properly sooner, if not employed, than in the connubial state.

The same cause which tends to induce abortion at a certain age in those who remained until that time single, will also, at a period somewhat later, induce it in those who have been younger married: for in them we find, that after bearing several children, it is not uncommon to conclude with an abortion; or sometimes after this incomplete action, the uterus, after a considerable time, recruits, as it were, and the woman carries a child to the full time, after which she ceases to conceive.

In the next place, I mention that one abortion paves the way for another, because, setting other circumstances aside, it gives the uterus a tendency to stop its action of gestation at an early period after conception, and therefore it is difficult to make a woman go to the full time, after she has miscarried frequently. This fact has also been explained upon the principle of repeated abortion weakening the uterus *, and this certainly may have some influence. The renewed operation of those causes which formerly induced abortion, may also account in many cases for its repetition. But I am also inclined to attribute the recurrence, sometimes, to habit alone, by which I understand that tendency, which a part has to repeat or continue those modes of acting which it has frequently performed, as we see in many diseases of the stomach and windpipe, spasmodic affections of these and other organs, being apt to return at the same hour, for a long time. With regard to the uterus, one remarkable instance is related by Schubzius, of a woman, who, in spite of every remedy, miscarried twenty-three times in the third month. In this and similar cases, slighter causes applied at the period when abortion formerly happened, will be sufficient to induce it, than would be required at another time. The ordinary and unavoidable exertions of life may be sufficient to excite abortion in this circumstance.

We also find that an excessive or indiscriminate use of venery, either destroys the power of the organs of generation altogether, making the woman barren, or it disposes to abortion, by enfeebling these organs.

Some slight change of structure in part of the uterus, by influencing its actions, may, if it do not prevent conception, interfere with the process of gestation, and produce prema-

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* "Per hanc vero consuetudinem nihil aliud intelligo, quam pravam vasorum uteri laxitatem et inde provenientem humorum stagnationem, ex abortiendi labore sæpius repetito inductam."

HOFFMAN, TOM. iii. p. 180.

ture expulsion. If, however, the part affected be very small, and near the os uteri, it is possible for pregnancy to go on to the full time. Indeed, it generally does go on, and the labour, as may be foreseen, will be very tedious; but the operation of cutting the indurated os uteri, which has been proposed, is seldom necessary.

I have known one instance, in which a very considerable part of the uterus, I may say almost the whole of it, was found after delivery, to be extremely hard, and nearly ossified: but this state could not have existed before impregnation took place, for I cannot conceive that so great a proportion of the uterus should have been originally diseased, and yet that conception, and its consequent actions, should take place; but there is no difficulty in supposing, that during the enlarging of the uterus, the vessels deposited osseous or cartilaginous matter, instead of fibres. In this case, it is evident that the delivery must be instrumental, owing to the deficiency of fibres, and recovery can seldom take place. Often we find this morbid action affect the placenta, instead of the uterus; but this is not dangerous *; unless to so great a degree as to effect the vitality of the child, in which case, death and premature expulsion must be the consequence.

A general weakness of the system, which must affect the actions of the uterus, in common with those of other organs, is likewise to be considered as giving rise to abortion, though not so frequently as was at one time supposed.

A local weakness of the uterus sometimes exists when the general system is not very feeble, or when the constitution is delicate, the uterus may be weaker in proportion than other organs.

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* In some instances, when the ossification is extensive, it may give rise to hemorrhage during labour, or after delivery. When this state is complicated with strong adhesion to the uterus, it will require attention to prevent bad consequences after the child is expelled; but by care, danger may in general be prevented, and the placenta be got away entire.

In this case it cannot perform its function with the necessary activity and perfection, but is very apt, after a time, to flag. We cannot operate with medicines directly upon the womb, for the purpose of strengthening it, but must act on it by invigorating the general system, and attending to all the other functions. Sea-bathing is of great service, and after impregnation, every exciting cause of abortion must be guarded against. Women of this description are generally pale, of a weakly flabby habit, and subject to irregular, often to copious, menstruation, or fluor albus. When they conceive, the cold-bath, light digestible food, open bowels, and free air, should be enjoined; and if any uneasy sensation be felt about the uterus or back, or the pulse throb a little, blood should be slowly taken away, and the woman keep her room for some days. Bleeding prevents the womb from being oppressed, and it is as necessary to attend to this, as it is to prevent the stomach from being loaded in a dyspeptic patient. But, on the other hand, were we to bleed copiously, we might injure the action of the uterus, and destroy the child.

It has been supposed that abortion might arise from a rigidity of the uterus, which prevented its distention. But the uterus does not distend like a dead part, upon which pressure is applied, but it grows, and therefore I apprehend that an effect is here considered as a primary cause.

Sometimes a chronic inflammation of the throat is excited by, or connected with a tumor in the side of the neck pressing on the eighth pair of nerves, and producing varying affections of the stomach and breast. These, as well as the size of the tumor, are generally increased by pregnancy, and sometimes abortion seems to proceed from this cause.

The uterus is not only affected by the general conditions of the system, more especially with regard to sensibility, and the state of the blood vessels; but it likewise sympathizes with the principal organs, and may undergo changes in consequence of alterations in their state.

Thus we often find that loss of tone, or diminished action of the stomach, produces amenorrhœa; and it may also on the same principle induce abortion; on the other hand, the action of the uterus may influence that of other viscera, as we see in pulmonary consumption, which is sometimes suspended in its progress during pregnancy: or, if there be any disposition in an organ to disease, frequent abortion, partly by sympathy betwixt the uterus and that organ, and partly by the weakness which it induces, and the general injury which it does to the system at large, may excite the irregular or morbid action of the organ so disposed.

As the action of the uterus is increased during pregnancy, it must require more nervous energy; but the size of the nerves of the uterus is not increased in proportion to the action; we must therefore depend for the increased supply upon the trunks, or larger portion of nervous substance, from which they arise; for we well know that the quantity of energy expended in an organ, does not depend upon the size of the nerve in its substance, but on the trunk which furnishes it. Whenever action is increased in an organ, it must either perish, or the larger nerve must send the branches more energy, for the branches themselves cannot form it, their extremities being only intended for expending it; from which it follows, that in pregnancy there must be more energy sent to the uterus, and less to some other part.

This is the case with all organs whose action is increased, other parts being deprived in proportion as they are supplied, except when irritation raises general action above the natural degree; the consequence of which is, that the power is not sufficient for the action, which becomes irregular, and the system is exhausted, as we see in febrile conditions *.

There being increased action of the uterus in gestation, requiring an increased quantity of energy to support it, we find that the system is put *pro tempore* into an artificial state, and obliged either to form more energy, which cannot be so easily done, or to spend less in some other part. Thus the function of nutrition, or the action by which organic matter is deposited, in room of that which is absorbed, often yields, or is lessened, and the person becomes emaciated, or the stomach has its action diminished, or the bowels producing costiveness and inflation. If no part give way, and no more energy than usual be formed, gestation cannot go on, or goes on imperfectly. Hence some women have abortion induced by being too vigorous; that is to say, all the organs persist in keeping up their action in perfection and complete degree.

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* For a fuller explanation and defence of this doctrine, I beg leave to refer the reader to some observations on the animal economy, prefixed to the first volume of my Dissertation on Inflammation.

A tendency to abortion also results from a contrary cause, from organs yielding too readily, allowing the uterus to act too easily. In this state it is as liable to go wrong, as the general system is when it is at the highest degree of action, compatible with health, the most trifling cause deranges it. Thus, sometimes, the intestines yield too readily, and become almost torpid, so that a stool can with difficulty be procured. Here costiveness is not a cause of abortion, though it may be blamed. In like manner, the muscular system may yield and become enfeebled; and in this instance debility is accused as the cause of abortion, although it be, indeed, only an effect of too much energy being destined for the uterus. In this case, the woman is always weaker during menstruation and gestation than at other times.

Now this is not a piece of idle speculation, but is of much practical importance, especially in considering the means of correcting habitual abortion: and much attention should be paid to the state of the principal organs in the body; for, if we confine our attention merely to the uterus, we shall often fail when otherwise we might succeed; and it will be necessary to remember, that the chain of sympathies in gestation is often extensive and complicated.

The state of the stomach, for example, may give rise to head-ache, tooth-ache, &c. and often it is dangerous suddenly to remove these remote effects. It throws too much energy to the uterus; its action is too much exerted; contraction and abortion take place: but in the unimpregnated state, the removal of these effects may, on the contrary, be useful: thus the pulling of a pained tooth sometimes speedily produces the return of the menses in cases of obstruction.

If the neighbouring parts do not accommodate themselves to the changes in the direction of energy, and act in concert with the uterus, their action becomes irregular, and consequently painful. In this case the uterus may have its just degree of power and action; but other parts may not be able to act so well under the change of circumstances. This is chiefly the case in early gestation, for, by time, the parts come to act better. It often gives rise to unnecessary alarm, being mistaken for a tendency to abortion; but the symptoms are different. The pain is felt chiefly at night, a time at which weakened parts always suffer most; it returns pretty regularly for several weeks, but the uterus continues to enlarge, the breasts to distend, and all things are as they ought to be, if we except the presence of the pain. This may be alleviated by bleeding, and sometimes by anodynes, but can only be cured by time, and avoiding, by means of rest and care, any additional injury to parts already irregular and ticklish in the performance of their actions. If this be neglected, they will re-act on the uterus at last, and impede its function. It is therefore highly necessary, especially in those disposed to abortion, to pay attention to pains about the back, loins, or pubes; and to insist upon rest, open bowels, and detracting blood, if the state of the vascular system indicate evacuation.

Even although the different organs, both near and remote, may have accommodated themselves to the changes in the uterine action, in the commencement of gestation, the proper balance may yet be lost at a subsequent period; and this is most apt to take place about the end of the third, or beginning of the fourth month, when the uterus is rising out of the pelvis: and hence a greater number of abortions take place at that time, than at any other stage of pregnancy. There is from that time, to the period of quickening, a greater susceptibility in the uterus to have its action interrupted, than either before or afterwards, which points out the necessity of redoubling our vigilance in watching against the operation of any of the causes giving rise to abortion from the tenth to the sixteenth week.

If the uterus, in its unimpregnated state, become very torpid, as in some cases of amenorrhœa, the abdominal muscles sometimes have their action much increased; and there is absolutely an attempt made to expel it, violent paroxysms of contraction coming on, and repeated daily for a length of time.

These may be lessened by opiates, but can only be cured by exciting the natural action of the uterus. I mention this fact, from its singularity, although it do not immediately refer to abortion.

If the action of gestation go on under restraint, as, for instance, by a change of position in the uterus, or by its prolapsing too low in the vagina, it is very apt to be accompanied by uneasy feelings, for, whenever any action is constrained, sensation is produced. The woman feels irregular, and pretty sharp pains in the region of the uterus, and from sympathetic irritation both the bladder and rectum may be affected, and occasionally a difficulty is felt in making water, by which a suspicion is raised that retroversion is taking place.

Sometimes the cervical vessels in these circumstances yield a little blood, as if abortion were going to happen; but by keeping the patient at rest, and attending to the state of the rectum and bladder, no harm is done: and when the uterus rises out of the pelvis, no farther uneasiness is felt. Occasionally a pretty considerable discharge may take place under these circumstances, if the vascular system be full, or the vessels about the cervix large. But by care, gestation will go on; for discharge alone does not indicate that abortion must necessarily happen. It, indeed, often causes abortion, and is almost always an attendant upon it; but we form our judgment not from this symptom alone, but also from the state of the muscular fibres, and the vitality of the child.

Retroversion of the uterus likewise constrains very much its action, and may give rise to abortion, though in a greater number of instances, by care, gestation will go on, and the uterus gradually ascend. The bowels are to be kept open, and the urine regularly evacuated. At the same time we endeavour to replace the uterus, and this I believe is to be done by dexterity, rather than by great force. I have long been of opinion, that much harm has been done in this disease, as well as in hernia, by rude attempts to reduce the parts when tender; and, in the latter disease, I am sure that the accession of gangrene, has frequently been hastened by them. When abortion succeeds retroversion, it sometimes proceeds rather from the morbid state of the bladder, than from the position of the uterus; and in this case it is a very unfavourable sign.

Sometimes in irritable or hysterical habits, the process of gestation produces a considerable degree of disturbance in the actions of the abdominal viscera, particularly the stomach, exciting frequent and distressing retching or vomiting, which may continue for a week or two, and sometimes is so violent, as to invert the peristaltic motion of the intestines near the stomach, in which case feculent matter, and, in some instances, lumbrici are vomited.

This affection is often accompanied by an unsettled state of mind, which adds greatly to the distress. We sometimes, in these circumstances, have painful attempts made by the muscles to force the uterus downward, and these are occasionally attended by a very slight discharge of blood. We have, however, no regular uterine pain; and, if we are careful of our patient, abortion is rarely produced.

The best practice is to take away a little blood at first, to keep the bowels open, to lessen the tendency to vomit, by applying an opium plaster, or a small blister, to the region of the stomach, and to allay pain by doses of hyoscyamus or opium, conjoined with carminatives. When the mind is much affected, or the head painful, it is proper to shave the head, and wash it frequently with cold vinegar, or apply a blister, at the same time that we keep the patient very quiet, and have recourse to a soothing management.

In some instances, the woman begins very early to have frequent vomiting, not confined to the morning, but occurring at all times of the day, and without any affection of the mind. This is best treated by taking away a little blood when the vomiting first becomes troublesome; by keeping the bowels open, and giving a little light food at that time when the stomach is most disposed to receive it.

It is not improper to remark that at different stages of pregnancy, the stomach may become exceedingly irritable, and even inflamed. This state is indicated by frequent pulse—heat of the skin—tenderness about the stomach—and feeling of heat, sometimes mistaken for heart-burn—oppression—constant vomiting—and frequently black flakes may be observed in the fluid which is ejected—thirst is urgent—and the belly bound. Sometimes the whole tract of the œsophagus is inflamed, and the fauces appear of a deep red colour. If the patient survive, she is in great danger of abortion. The proper treatment consists in early and copious evacuation of blood—the administration of laxatives—the application of a blister to the stomach—and giving only very small quantities of bland fluid, frequently to assuage the intolerable thirst.

The uterus being a large vascular organ, is obedient to the laws of vascular action, whilst the ovum is more influenced by those regulating new-formed parts; with this difference, however, that new-formed parts or tumours are united firmly to the part from which they grow by all kinds of vessels, and generally by fibrous or cellular substance, whilst the ovum is united to the uterus only by very tender and fragile arteries and veins. If, therefore, more blood be sent to the maternal part of the ovum, than it can easily receive and circulate, and act under, rupture of the vessels will take place, and an extravasation and consequent separation be produced; or even when no rupture is occasioned, the action of the ovum may be so oppressed and disordered, as to unfit it for continuing the process of gestation. There must, therefore, be a perfect correspondence betwixt the uterus and the ovum, not only in growth and vascularity, but in every other circumstance connected with their functions.

Even when they do correspond, if the uterus be plethoric, the ovum also must be full of blood, and rupture very apt to take place; and this is a frequent cause of abortion, more especially in those who menstruate copiously. On the other hand, when the uterus is deficient in vascularity, which often happens in those who menstruate sparingly or painfully, the child generally dies before the seventh month, and is expelled. The process is prematurely and imperfectly finished.

The existence of plethora is to be considered as a very frequent cause of abortion, and requires most particular attention. It more especially obtains in the young and vigorous, or in those who live luxuriously, and sleep in soft warm beds. It renders the uterus too easily supplied with blood: the increase is not made in the regular degree, corresponding to the gradual increase of action, and augmentation of size; but it is, if I may use the expression, forced on the uterus, which is thus made for a time to act strongly and rapidly. This action is sometimes so great, that the person feels weight in the region of the uterus, and shooting pains about the pelvis; but in other instances the vessels suddenly give way, without previous warning, and the blood bursts forth at the os uteri. This cause is especially apt to operate in those who are newly married, and who are of a salacious disposition, as the action of the uterus is thus much increased, and the existence of plethora rendered doubly dangerous. In these cases, whenever the menses have become obstructed, all causes tending to increase the circulation, must be avoided, and often a temporary separation from the husband is indispensable. Often do we find that slight exertion within a fortnight after the menses stop, will produce a speedy and violent eruption of blood, which continues until the vessels are fully unloaded; and until all that part of the process of forming an ovum, which has been effected, be undone.

Abortion necessarily implies separation of the ovum*, which may be produced mechanically or by spontaneous rupture of the vessels, or by an affection of the muscular fibres. It unavoidably requires, for its accomplishment, contraction of those fibres which formerly were in a dormant state. A natural and necessary effect of this contraction is to develope the cervix uteri.

This, when gestation goes on regularly, is accomplished gradually and slowly by the extension and formation of fibres. In abortion, no fibres are formed; but muscular action does all, except in those instances where the action of gestation goes on irregularly and too fast; in which case the cervix distends, sometimes by the third month, by the same process which distends the fundus. But much more frequently the cervix only relaxes during abortion, as the os uteri does in natural labour, and yields to the muscular action of the fundus, or distended part.

The existence and growth of the fœtus depend on the fœtal portion of the ovum. The means of nourishment, and the accommodation of the fœtus in respect of lodgment, depend on the uterus; and these circumstances requiring both fœtal and maternal action, are intimately connected. The condition of the uterus qualifying it to enlarge, to continue the existence and operation of the maternal portion of the placenta or ovum, and to transmit blood to the ovum, exactly in the degree correspondent to its want, constitutes the action of gestation.

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* In every instance, even when the fœtus escapes first, and the membranes and placenta are retained, the ovum must be separated from the under part of the uterus, and the vessels of communication, torn by abortion, may in one sense be said to have taken place, whenever the child is expelled, but the process cannot properly be said to be over until the secundines have come away.

When this condition ceases, then muscular contraction begins, provided the cessation be universal in the uterus. This is necessary, for as the fœtal and maternal actions are dependent on each other, the fœtus would suffer if it were not expelled. The injury, indeed, will not be immediate; otherwise, in labour, the child would die before it could be born; because labour implies a cessation of the action of gestation. On the other hand, the loss of action in the fœtal part will soon influence the maternal part, and stop its action.

In labour, and at other times, when the action of gestation ceases, the circulation is still kept up in the maternal vessels of the placenta, until either separation and expulsion take place, or the vessels suffer so much as to cease to transmit blood. The cessation of action then does not necessarily immediately affect the fœtus. As long as it and the fœtal portion of the ovum, connected with it, remain stationary, the same quantity of blood will do. But the uterus cannot now increase its actions along with those of the fœtus, so as gradually to enlarge and send more blood.

This is one cause of disagreement. Another is, that in consequence of cessation of action in the uterus, the maternal portion of the placenta or ovum ultimately suffers, and flags or decays, whilst the fœtal portion must sympathize with it.

From this it results, first, that even in tedious labour, the child does not die: secondly, that when the action ceases in the early months of pregnancy, the fœtus does not instantly die, nor abortion immediately take place: thirdly, but it invariably happens, that at whatever period the action ceases, the fœtus will, if not expelled within a certain time, perish.

I have elsewhere * endeavoured to prove, that we have

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* Vide Dissertations on Inflammation, Vol. I.

a certain quantity of action present in the system at large, and properly distributed amongst the different organs, forming an equilibrium of action; and that if one organ acts in an over degree, another which is connected with it, will have its action lessened, and *vice versa.*

The same holds true with regard to different actions belonging to the same organ: and the fact is of considerable importance, both in explaining and curing diseases. During pregnancy, the muscular fibres of the uterus are dormant, possessing no contractile action; at least, none qualifying them for contracting, so as to make the uterus smaller.

I doubt much if even the individual fibres possess a power of alternately contracting and relaxing, as in other muscles, in any degree whatever. But whenever the action of gestation ceases, action is communicated to these fibres; and whenever this loss on the one part, and gain upon the other, is universally begun in the womb, the transference will be completed, and the ovum can no longer be preserved in the uterus.

The loss of action is generally speedy, when once begun. Perhaps in most instances it takes place instantaneously, and then the fibres begin individually to act; but they may not for some hours, contract universally, and all at one and the same time producing pains *.

But if some other organ shall receive the surplus of action, or the transferred action, then the uterine fibres either will not contract, or will receive an inferior and insufficient degree of action, and expulsion will not take place until the organ sympathizing shall cease to have the increased action, whether it be the brain, the stomach, or the external muscles of the body. Sometimes also the action seems to be divided betwixt the uterus and other organs, or they alternate in their actions.

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* In some cases, the fibres about the os uteri, or lower part of the cervix, assume the contractile action long before the rest, and produce slight irregular motions, which, if neglected, may excite general contraction. But if the fibres of the body, and fundus of the uterus, assume this action, then nothing can prevent expulsion, for the action of gestation is destroyed in every instance before they begin to contract.

This fact is of importance in explaining and correcting many of the irregularities attending labour, which it would be impossible here to specify.

Sometimes the action is chiefly communicated to one part of the uterine fibres, whilst the rest are more torpid; and this part contracts in an undue degree, clasping the child firmly, and retarding labour*; and, after expulsion, it is apt to return, and retain the placenta, whilst the rest of the uterus becomes torpid, producing flooding.

If, then, the action of gestation cease universally in the uterus, another action, namely, muscular contraction, begins, and then all hope of retaining the ovum any longer is at an end. I know that we have been told of instances where contraction, after beginning, stopped for several weeks.

The os uteri may be prematurely developed; it may be open for some weeks, even without pain; but no man will say that, in this case, labour or uterine contraction has begun. We may even have partial muscular action, in a few very rare cases, about the os uteri, which has less to do with the action of gestation than any other part of the uterus; and this action is often attended with considerable pain or uneasiness. Sometimes it is connected with convulsive agitation of several of the external muscles of the body. Even in this case, expulsion does not always immediately take place; for by bleeding, and rest, and opiates, the motion may sometimes be checked; but regular and universal action of the muscular fibres never yet has been stopped. It may, like other muscular actions, be suspended by anodynes, or artificial treatment; but it never has, and never can be stopped, otherwise than by the expulsion of the ovum, when a new train of actions commence.

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* This contraction is sometimes so firm after the membranes have burst, as to produce the same effect upon the child, as the natural pains would have done, had the pelvis been deformed; that is to say, the presentation becomes unshapely, and the part below the stricture is swelled and livid. This spasm, like that which sometimes retains the placenta, is very difficult to be relaxed, and, in general, requires artificial management. If it come on at the full time, before the membranes break, it may give such a feeling to the lower part of the ovum, as to make it resemble a preternatural presentation, although the head really present. In this case, the band is generally pretty broad, but its contraction is not violent. It has the effect, however, of retarding labour, until we break the membranes, which excites a more general and effective action in the uterine fibres.

Whenever, then, at any period of pregnancy, we have paroxysms of pain in the back *, and region of the uterus, more especially if these be attended with feeling of weight in that region, tenesmus, micturition, descent of the uterus in the pelvis, and opening of the os uteri, we may be sure that expulsion, though retarded, will soon take place †.

This fact is not always attended to in abortion, for many think that if by anodynes they can abate the pain, they will make the woman go to the full time.— This is true, with regard to many painful sensations, which may attend a threatened abortion, or which may be present, although there be no appearance of abortion; but it does not hold with regard to those regular pains proceeding from universal action

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* It may not be improper to mention, that in some febrile affections we have pain in the back and loins, occasionally remitting or disappearing altogether for a short space, and then returning. Sometimes along with this we have, owing to the affection of the circulation, and in some instances to previous exertion, a slight discharge from the vessels about the os uteri. This state is distinguished from uterine contraction, by our finding that the cervix is unaffected, that the pains are increased by motion or pressure, and are more irregular than those attending labours. This state may be prevented from inducing abortion by rest, by keeping the bowels open, by anodynes preceded by venesection, if the pulse indicate it. Frictions, with camphorated spirits of wine or laudanum, give relief. Any exertion, during the remaining period of gestation, will renew the pain in the back.

‡ We are careful to examine the state of the uterus, ascertaining its universal contraction by finding that the membranes become a little tight during a pain, provided that pregnancy be so far advanced as to allow them to be felt in the early part of the process.

of the uterine fibres; and we may save both ourselves and our patients some trouble, by keeping this in remembrance.

Seeing then that contraction is brought on by stopping the action of gestation, and that when it is brought on it cannot be checked, nor the action of gestation restored, we must next inquire how this action may be stopped. I have already mentioned several circumstances affecting the uterus, and likely to injure its actions; and these I shall not repeat, but go on to notice some others, which are often more perceptible; and first I shall mention violence, such as falls, blows, and much fatigue, which may injure the child, and detach part of the ovum.

If part of the ovum be detached, we have not only a discharge of blood, but also the uterus at that part, suffers in its action, and may influence the whole organ, so as to stop the action universally. But the time required to do this is various, and opportunity is often given to prevent the mischief from spreading, and to stop any farther effusion—perhaps to accomplish a re-union.

Violent exercise, as dancing, for instance, or much walking, or the fatiguing dissipations of fashionable life, more especially in the earlier months, by affecting the circulation, may vary the distribution of blood in the uterus, so much as to produce rupture of the vessels, or otherwise to destroy the ovum. There is also another way in which fatigue acts, namely, by subducting action and energy from the uterus: for the more energy that is expended on the muscles of the inferior extremities, the less can be afforded or directed to the uterus; and hence abortion may be induced at an early stage of gestation *.

Even at a more advanced period, inconvenience will be produced upon the principle formerly mentioned; for the nerves of the loins conveying less energy, in many instances,

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* The same effect is observable in the stomach and other organs. If a delicate person, after a hearty meal, use exercise to the extent of fatigue, he feels that the food is not digested, the stomach having been weakened or injured in its actions.

though not always to the muscles, they are really weaker than formerly, and are sooner wearied, producing pain, and prolonged feeling of fatigue for many days, after an exertion which may be considered as moderate.

This feeling must not be confounded with a tendency to abortion, though it may sometimes be combined with it, for generally by rest the sensation goes off. Neither must we suppose that the child is dead, from its being usually quiet during that period, for as soon as the uterus, which has been a little impaired in its action, recovers, it moves as strongly as ever.

In the next place, I mention the death of the child, which may be produced by syphilis, or many diseases perhaps peculiar to itself, or by injury of the functions of the placenta, which may arise from an improper structure of that gland itself, or aneurism, or other diseases of the cord. But in whatever way it is produced, the effect is the same in checking the action of gestation, unless there be twins, in which case it has been known that the uterus sometimes did not suffer universally, but the action went on, and the one child was born of the full size, the other small and injured *.

The length of time required for producing abortion from this cause is various; sometimes it is brought on in a few hours: at other times not for a fortnight, or even longer. In these and similar cases, when the muscular action is commencing, the discharge is trifling, like menstruation, until the contraction becomes greater, and more of the ovum be separated. When symptoms of abortion proceed from this cause, it is not possible to prevent its completion; and it would be hurtful even if it were possible. When, there-

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* It has even been known, that in consequence of the death of one child, the uterus has suffered partially, and expulsion takes place; but the other child continuing to live, has preserved the action of gestation in that part of the uterus, which, properly speaking, belonged to it, and pregnancy has still gone on. This, however, is an extremely rare occurrence; for in almost every instance, the death of one child produces an affection of the action of gestation in the whole uterus, and the consequent expulsion of both children.

fore, after great fatigue, profuse evacuations in delicate habits, violent colic, or other causes, the motion of the child ceases, the breasts become flaccid, and the signs of gestation disappear; we need not attempt to retard expulsion, but should direct our principal attention to conduct the woman safely through the process.

A third cause is a disproportioned action betwixt the uterus and ovum, the one not increasing in the same ratio with the other, yet both continuing to act. This is productive of frequent discharges of blood, repeated at different, but always at short intervals, for several weeks, until at length the uterus suffers so much, that its action stops, or the fœtus dies.

Another cause is, any strong passion of the mind. The influence of fear, joy, and other emotions, on the muscular system, is well known; and the uterus is not exempted from their power; any sudden shock, even of the body, has much effect on this organ. The pulling of a tooth, for instance, sometimes suddenly produces abortion.

Emmenagogues, or acrid substances, such as savine and other irritating drugs, more especially those which tend to excite a considerable degree of vascular action, may produce abortion.

Such medicines, likewise, as exert a violent action on the stomach or bowels, will, upon the principle formerly mentioned, frequently excite abortion; and very often are taken designedly for that purpose in such quantity as to produce fatal effects; and here I must remark, that many people at least pretend to view attempts to excite abortion as different from murder, upon the principle that the embryo is not possessed of life, in the common acceptation of the word. It undoubtedly can neither think nor act; but upon the same reasoning, we should conclude it to be innocent to kill the child in the birth.

Whoever prevents life from continuing, until it arrive at perfection, is certainly as culpable as if he had taken it away after that had been accomplished. I do not, however, wish from this observation, to be understood as in any way disapproving of those necessary attempts which are occasionally made to procure premature labour, or even abortion, when the safety of the mother demands this interference, or when we can thus give the child a chance of living, who otherwise would have none.

If any part with which the uterus sympathizes have its action greatly increased during pregnancy, the uterus may come to suffer, and abortion be produced. Hence the accession of morbid action or inflammation in any important organ, or on a large extent of cuticular surface, may bring on miscarriage, which is one cause why small-pox often excites abortion, whilst the same degree of fever, unaccompanied with eruption, would not have had that effect.

Hence also increased secretory action in the vagina, if to a great degree, though it may have even originally been excited in consequence of sympathy with the uterus, may come to incapacitate the uterus for going on with its actions, and therefore it ought to be checked by means of an astringent injection.

In this case the uterus has, without any proof, been supposed to become too much relaxed, whilst in other cases, as for instance, when the abdomen was harder than usual, it has with as little foundation been supposed to be preternaturally rigid *.

Mechanical irritations of the os uteri, or attempts to dilate it prematurely, will also be apt to bring on muscular contraction. At the same time, it is worthy of remark, that the effect of these irritations is generally at first confined to the spot on which they act, a partial affection of the fibres in the immediate vicinity of the os uteri being all that is for some time produced; and, therefore, slight uneasiness at the lower part of the belly, with or without a tendency in

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* Rœderer, supposes that periodic abortion proceeds from the uterus being incapable of distending beyond a certain size. Vide Elementa, cxxii.—Roderic a Castro, supposes that it proceeds " a nimia humiditate orificiis matricis." Vide De Morb. Mulier, p. 462.

the os uteri to move or dilate, whether brought on by irritation at the upper part of the vagina or os uteri, or by affection of the neck of the bladder, &c.[*] may be often prevented from extending farther, and destroying the action of gestation by rest, anodynes, and having immediate recourse to such means as the nature of the irritation may require for its removal[†].

The irritation of a prolapsus ani, or of inflamed piles, with or without much sanguinous discharge, may excite the uterus to contract; and if the bleeding from the anus have been profuse, and the woman weakly, it may destroy the child. The piles ought, therefore, never to be neglected. The bowels should be kept open. An anodyne clyster may be given if the pain be great, and a poultice applied, consisting of curd of milk, and a little laudanum, or a liniment made up of thick cream, with a little of the extract of lead, or expressed juice of belladona.

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[*] It is an old observation, that those purgatives, which produce much tenesmus, will excite abortion; and this is certainly true, if their operation be carried to a considerable extent, and continue long violent. Hence dysentery is also apt to bring on a miscarriage. Those strong purges which are sometimes taken to promote premature expulsion, not only act by exciting tenesmus, but likewise by inflaming the stomach and bowels, and thus affect the uterus in two ways. It cannot be too generally known, that when these medicines do produce abortion, the mother can seldom survive their effects. It is a mistaken notion, that abortion can be most readily excited by drastic purges, frequent and copious bleeding, &c. immediately after the woman discovers herself to be pregnant; on the contrary, the action of the uterus is then more independent of that of other organs, and therefore, not so easily injured by changes in their condition. I have already shown, that abortion more frequently happens when the pregnancy is farther advanced, because then not only the uterus is more easily affected, but the fœtus seems to suffer more readily. It is apt, either from diseases directly affecting itself, o from changes in the uterine action, to die about the middle of the third month, in which case expulsion follows within a fortnight.

[†] Chronic inflammation of the heart is generally attended with pain at the bottom of the abdomen, which is sometimes mistaken for symptoms of calculus. In one case, abortion seemed to proceed from this disease of the heart.

Tapping the ovum, by which the uterus collapses and its fibres receive a stimulus to action, is another cause by which abortion may be produced; and this is sometimes, with great propriety, done at a particular period, in order to avoid a greater evil.

It is now the general opinion, that contraction will unavoidably follow the evacuation of the waters. But we can suppose the action of gestation to be in some cases so strong as not at least for a very considerable time, to stop in consequence of this violence, and, if it do not stop, contraction will not take place. I do not, however, mean to say, that all discharges of watery fluid from the uterus, not followed by abortion, are discharges of the liquor amnii, and instances of this failing speedily to produce contraction. On the contrary, I know that most of these effusions are the consequence of morbid action about the os uteri, the glands yielding a serous instead of a gelatinous fluid, and this action may continue for many months.

Sometimes the upper range of lacunæ yields water, whilst the under secretes jelly, which confines the water for some hours, until it accumulates, and comes out with a small gush. At other times, in the early period of gestation, it collects in considerable quantity betwixt the lower part of the decidua protrusa, which has not yet reached the cervix uteri and the gelatinous plug, which becomes a little stronger than usual.

There is thus a species of dropsy produced, and the water is sometimes confined until a little before labour comes on; at other times it is discharged sooner, and an oozing continues for many weeks. In some instances water is collected betwixt the chorion and amnion, or a large hydatid occupies the lower part of the uterus, whilst the ovum lies above it. But in whatever way we may suppose the water to be collected, there are examples of a very astonishing quantity having been discharged about the middle or end of pregnancy, without exciting the expulsive action of the uterus. In all these cases the woman must be confined to bed, and have an anodyne every night at bed-time, for some time, premising venesection if the pulse indicate it, and conjoining gentle laxatives. There is just so much probability of gestation going on as to encourage us to use endeavours to continue it. In those instances where the discharge is small, and the oozing pretty constant, we conclude that it is yielded chiefly by the glands about the os uteri, and may derive advantage from injecting three or four times a day a strong infusion of galls, or solution of alum. The woman ought to use no exertion, as the membranes are apt to give way.

When the liquor amnii really is evacuated, sometimes a spasmodic contraction of the fibres near the cervix takes place, instead of that regular action which is necessary for expulsion; and if the whole of the liquor have not escaped, the remaining portion will be confined by the tightening of that part of the uterus round the fœtus; and this contraction may endure for a very considerable time. If not interrupted, it may lay the foundation of future diseases in the uterus.

OF THE PROGNOSIS.

THE danger of abortion is to be estimated by considering the previous state of the health, by attending to the violence of the discharge, and the difficulty of checking it; to its duration, and the disposition to expulsion which accompanies it; to the effects which it has produced in weakening the system, and to its combination with hysterical or spasmodic affections. In general, we say that abortion is not dangerous, yet in some cases it does prove fatal very speedily, either from loss of blood, or spasms about the stomach, or convulsions.

It is satisfactory, however, to know, that this termination is rare, that these dangerous attendants are seldom present, and that a great hemorrhage may be sustained, and yet the strength soon recover. But if there be any disposition in a particular organ to disease, abortion may make it active, and thus, at a remote period, carry off the patient. Miscarriages, if frequently repeated, are also very apt to injure the health, and break up the constitution.

When abortion is threatened, the process is very apt to go on to completion; and it is only by interposing, before the expulsive efforts are begun, that we can be successful in preventing it, for whenever the muscular contraction is universally established, marked by regular pains, and attempts to distend the cervix and os uteri, nothing, I believe, can check the process. As this is often the case before we are called, or as in many instances abortion depends on the action of gestation being stopped by causes, whose action could not be ascertained until the effect be produced, we shall frequently fail in preventing expulsion.

This is greatly owing to our not being called until abortion, that is to say, the expulsive process has begun; whereas, had we been applied to upon the first unusual feeling, it might have been prevented. What I wish then particularly to inculcate is, that no time be lost in giving notice of any ground of alarm, and that the most prompt measures be had recourse to in the very beginning; for when uterine contraction has commenced, then all that we can do is to conduct the patient safely through a confinement, which the power of medicine cannot prevent.

The case of threatened abortion, in which we most frequently succeed, is that arising from slipping of the foot, or causes exciting a temporary over-action of the vessels, producing a slight separation, because here the hemorrhage immediately gives alarm, and we are called before the action of gestation be much affected.

Could we impress upon our patients the necessity of equal attention to other preceding symptoms and circumstances, we might succeed in many cases where we fail from a delay, occasioned by their not understanding that an expulsion can only be prevented by interfering before it begins; but that when sensible signs of contraction appear, the mischief has proceeded too far to be checked. Prompt and decided means used upon the first approach of symptoms indicating a hazardous state of the uterus, or on the earliest appearance of hemorrhage, may, provided the child be still alive, be attended with success.

OF THE PREVENTION AND TREATMENT OF ABORTION.

IN considering the treatment, I shall first of all notice the most likely method of preventing abortion in those who are subject to it; next, the best means of checking it, when it is immediately threatened; and, lastly, the proper method of conducting the woman through it, when it cannot be avoided.

The means to be followed in preventing what may be called habitual miscarriage, must depend on the cause supposed to give rise to it. It will, therefore, be necessary to attend to the history of former abortions; to the usual habitudes and constitution of the woman; and to her condition when she becomes pregnant.

In many instances a plethoric disposition, indicated by a pretty full habit, and copious menstruation, will be found to give rise to it. In these cases, we shall find it of advantage to restrict the patient almost entirely to a vegetable diet, and, at the same time, make her use considerable and regular exercise.

The sleep should be abridged in quantity, and taken not on a bed of down, but on a firm mattress, at the same time that we prevent the accumulation of too much heat about the body. The bowels ought to be kept open, or rather loose, which may be effected by drinking Cheltenham water: and this can be artificially prepared, if necessary.

There is, in plethoric habits, a weakness of many, if not all, of the functions; but this is not to be cured by tonics, but by continued and very gradually increased exercise, with light diet, consisting chiefly of vegetables. This plan, however, must not be carried to an imprudent length, nor established too suddenly; but regard is to be had to the previous habits. It is a general rule, that exercise should not be carried the length of fatigue, and that it should be taken, if possible, in the country, whilst late hours, and many of the modes of fashionable life, must be departed from. We may also derive so considerable advantage from conjoining with this plan, the shower-bath, or sea-bathing, that they ought not to be omitted. There is, I believe, no remedy more powerful in preventing abortion than the cold bath, and the best time for using it is in the morning. By means of this, conjoined with attention to the vascular system, and prudent conduct on the part of the patient, I suppose that nine-tenths of those who are subject to abortion, may go on to the full time. If the shower-bath be employed, we must begin with a small quantity of water; and, in some instances, may at first add so much warm water as shall make it just feel cold, but not give too great a shock. After conception, the exercise must be taken with circumspection: but the diet should still be sparing, and the use of the cold bath continued.

If the pulse be at any time full, or inclined to throb, or if the patient be of a vigorous habit, a little blood should be taken away at a very early period. In some cases where the action is great, we must bleed almost immediately after the suppression of the menses. It is not necessary to bleed copiously: it is much better to take away only a few ounces, and repeat the evacuation when required, and we should manage so as to avoid fainting. The cold bath should be conjoined, and we may derive much advantage by using the digitalis, so as slightly to affect the pulse, keeping it at or below its natural frequency, and diminishing its throbbing. But it is not requisite to be given to the degree employed in some other complaints; and, if it be pushed to an imprudent length, the child may suffer. Half a grain may be given, as often as may be found necessary, to bridle the circulation. It may be continued for two days, and then omitted for a day; and in this way it may be continued for a length of time; but it is seldom necessary to give it beyond the beginning of the fourth month, unless a change of circumstances afterwards require it *.

The dose must be occasionally increased, so as to produce the desired effect; and I can vouch for the safety of the plan.

Injecting cold water into the vagina, twice or thrice a day, has often a good effect, at the same time that we continue the shower-bath every morning. When there is much aching pain in the back, it is of service to apply cloths to it, dipped in cold water, or gently to dash cold water on it; or employ a partial shower-bath, by means of a small watering can.

In this, and all other cases of habitual abortion, we must advise that impregnation shall not take place until we have corrected the system; and after the woman has conceived, it is requisite that she live absque marito, at least until gestation be far advanced. I need scarcely add, that when consulted respecting habitual abortion, the strictest prudence is required on our part, and that the situation of the patient, and many of our advices, should be concealed from the most intimate friends of the patient.

In other cases, we find that the cause of abortion is connected with sparing menstruation. This is often the case with women whose appearance indicates good health, and who have a robust look. This is not often to be rectified by medicine, but it may by regimen, &c. Here, as in the former case, we find it useful to make the greatest part of the

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* In those cases where the digitalis produces feebleness, it is evidently improper to continue it regularly. Indeed, when this effect takes place, its farther exhibition is unnecessary.

diet consist of vegetables; but it is not necessary to restrict the quantity.

When, on the other hand, the patient has a weakly delicate appearance, it will be proper to give a greater proportion of animal food, and two or three glasses of wine in the afternoon, with some bitter laxative, twice a day, so as to strengthen the stomach, and at the same time keep the bowels open.

We also derive, in both cases, advantage from the daily use of the warm bath, made of a pleasant temperature; but this is to be omitted after conception: at least, for the first ten or twelve weeks, after which, if there be symptoms of irritation, or feeling of tension about the belly, or pain about the groins, or pubes, it may be employed, and is both safe and advantageous. But when the patient is of a phlegmatic habit, or subject to profuse fluor albus, it is not indicated, and sometimes is pernicious. The internal use of the Bath waters is often of service; or where the circumstances of the patient will not permit this, we may desire her to drink, morning and evening, a pint of tepid water, which may be continued during gestation. Throwing up into the vagina tepid salt-water twice or thrice a day, seems also to have a good effect.

I have already mentioned, that abortion is sometimes the consequence of too firm action, the different organs refusing to yield to the uterus, which is thus prevented from enjoying the due quantity of energy and action. These women have none of the diseases of pregnancy, or they have them in a slight degree. They have good health at all times, but they either miscarry, or have labour in the seventh or eighth month, the child being dead; or if they go to the full time, I have often observed the child to be sickly, and of a constitution unfitting it for living.

We may sometimes cure this state by giving half a grain of digitalis, and the eighth part of a grain of the tartris antimonii, every night at bed time, which diminishes the stomachic action. Bleeding is also useful, by making the organs more irritable. Exercise, so as to prove tonic, is hurtful in this species of abortion: instead of wishing to increase the action of any organ, our object is to diminish it, and make the different parts more easily acted on. The warm or tepid bath is, in general, of advantage, and may be employed every second evening for some time.

The accidental accession of an hysteric condition of the system, sometimes spontaneously cures this state: and if the patient have gone to the full time, but bear an unhealthy child from this cause; if she meet with any accident in her confinement, inducing a nervous condition, she is less apt afterwards to miscarry, or have dead children.

There is another case in which all the functions are healthy and firm, except the circulation, which is accelerated by the uterine irritation. This is more or less the case in every pregnancy, but here it is a prominent symptom. The woman is very restless, and even feverish, and apt to miscarry, especially if she be of a full habit. Immediate relief is given by venesection, and afterwards we may, for some time, give every night, half a grain or a grain of digitalis, with two grains of the extract of hyocyamus.

When, on the contrary, abortion arises from too easy yielding of some organ, we must keep down uterine action, by avoiding venery, and injecting cold water often into the vagina; or, pouring cold water every morning from a watering can, upon the loins and ilia. Clysters of cold water are also useful; but from the unpleasant sensation which they give, they ought not to be frequently employed: at the same time we must attend to the organ sympathizing with the uterus.

Sometimes it is the stomach which is irritable, and the person is often very sick, takes little food, and digests ill. A small blister, applied to the pit of the stomach, often relieves this; a little of the compound tincture of bark, taken three or four times a day, is serviceable; or a few drops of the tincture of muriated iron in a tumbler glassful of ærated water; at other times the bowels yield, and the patient is obstinately costive. This is best cured by manna, with the tartrite of potash. When the muscular system yields, producing a feeling of languor and general weakness, the use of the cold bath, with a grain of opium, at bed time, will be of most service.

It is evident that it is only by attending minutely to the history of former miscarriages, that we can detect these causes; and we shall generally find, that in each individual case it is the same organ in every pregnancy which has yielded or suffered. Previous to future conception, we may, with propriety, endeavour to render it less easily affected.

General weakness is another condition giving rise to abortion; and upon this I have already made some remarks. I have here only to add, that the use of the cold bath, the exhibition of the Peruvian bark, and wearing flannel next the skin, constitute the most successful practice.

Syphilis is likewise a cause of abortion. When it occurs in the mother, it often unfits the uterus for going on with its actions. At other times, more especially when the father labours under venereal hectic, or has not been completely cured, the child is evidently affected, and often dies before the process of gestation can be completed.

In these cases a course of mercury alone can effect a cure. But we are not to suppose that every child, born without the cuticle in an early stage of pregnancy, has suffered from this cause; on the contrary, as the majority of these instances depend on causes already mentioned, and which cannot be cured by mercury, I wish to caution the student against too hastily concluding that one of the parents has been diseased, because the child is born dead or putrid in the seventh month.

It is not always easy to form a correct judgment; but we may be assisted by finding that the other causes which I have mentioned are absent; that we have appearances of ulceration on the child, and that there are some suspicious circumstances in the former history and present health of the parents.

Advancement in life, before marriage, is another cause of frequent abortion, the uterus being then somewhat imperfect in its action. In general, we cannot do much in this case, except avoiding carefully the exciting causes of abortion, and by attending minutely to the condition of other organs, during menstruation or pregnancy, we may, from the principles formerly laid down, do some good.

It is satisfactory to know that, although we may fail once or twice, yet by great care the uterus comes at last to act more perfectly, and the woman bears children at the full time.

After these observations, it is only necessary to add, that in every instance of habitual abortion, whatever the condition may be which gives rise to it, we find that it is essential that the greatest attention be paid to the avoiding of the more evident and immediate exciting causes of miscarriage, such as fatigue, dancing, &c. In some cases, it may even be necessary to confine the patient to her room, until the period at which she usually aborts is past.

When abortion is threatened, we come to consider whether and by what means it can be stopped. I have already stated my opinion, that when the action of gestation ceases, it cannot be renewed, and that general contraction of the uterine fibres is a criterion of this cessation.

Still, as some of the means which may be supposed useful in preventing a threatened abortion, are also useful in moderating the symptoms attending its progress, we may very properly have recourse to them. Some causes giving rise to abortion, do not immediately produce it, but give warning of their operation, producing uneasiness in the vicinity of the uterus, before the action of that organ be materially affected.

The detraction of a little blood at this time, if the pulse be in any measure full or frequent; or, if the patient be not of a habit forbidding evacuations, and the subsequent exhibition of an anodyne clyster, or a full dose of digitalis and opium *, together with a state of absolute rest for some days, will often be sufficient to prevent farther mischief, and constitute the most efficacious practice. The patient should be strictly confined to bed, sleeping with few bed-clothes, and without a fire in her apartments. The diet should, in general, be low, consisting of dry toast, biscuit, and fruit; and much fluid, especially warm fluid, should be avoided.

This is the time at which we can interfere with the most certain prospect of success; and the greatest attention should be paid to the state of the rest of the system, removing uneasiness, wherever it is present, and preventing any organ from continuing in a state of undue action. It is difficult to persuade the patient to comply with that strict attention which is necessary at this period; but being persuaded that if this period be allowed to pass over with neglect, and contraction begins, nothing can afterwards prevent abortion, I wish particularly to impress the mind of the student with a due sense of its importance; and I must add, that as after every appearance of morbid uterine action is over, the slightest cause will renew our alarm, it is necessary that great attention be paid for some time to the patient.

Often, instead of an uneasy feeling about the loins, or lower belly, we have, before the action of gestation stops, a discharge of blood, generally in a moderate, sometimes in a trifling degree. This is more especially the case when abortion is threatened, owing to an external cause, and, if immediately checked, we may prevent contraction from beginning.

Even in those cases where we do not expect to ward off expulsion, it is useful to prevent, as far as we can, the loss of blood; for as I cannot see that the hemorrhage is necessary for its accomplishment, although it always attend it, I conclude that our attempts to prevent bleeding can never do

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* Opiates are of signal benefit in this situation, and should seldom be omitted after venesection.

harm; for if they succeed in checking abortion, we gain our object; if they fail, they do not increase, but diminish the danger.

It should be carefully remembered, that the more we can save blood, the more do we serve our patient. As the means for checking the discharge will be immediately pointed out, it is unnecessary here to enter into any detail.

Sometimes the vessels about the cervix and os uteri yield, post coitum, a little blood, and this may occur either in those who have the uterus in a high state of activity, or more frequently where it is feeble in its functions. The same discharge may sometimes appear in rather greater quantity after impregnation, passing perhaps for the menses, and making the woman uncertain as to her situation; but it is generally, though not always, irregular in its appearance, and seldom returns above once or twice. In some instances, however, it becomes greater and more frequent in proportion as the vessels increase in size. It is now apt to pass for menorrhagia.

If it be allowed to continue, it tends to injure the action of the uterus, and produces expulsion, which sometimes is the first thing which shows the woman her situation. This discharge is best managed by rest, and the frequent injection of saturated solutions of the sulphat of alumine, or decoction of oak bark.

When a slight discharge takes place, in consequence of a slip of the foot, or some other external cause, we may also derive advantage from the use of the injection, but not so certainly as in the former case; and if the discharge be considerable, the injection will fail. It is better, in this case, to trust to the formation of a coagulum.

When in a plethoric habit abortion is threatened, from a fright, or mental agitation, we have often palpitation, rapidity of the pulse, head-ach, flushed face, and pain about the back or pubes, bleeding relieves immediately the uneasiness in the head, and often the pain in the back; afterwards, the patient is to be kept cool and quiet, and an anodyne administered.

In those cases, where regular uterine pain precedes or accompanies the discharge, expulsion cannot be prevented; but when the discharge precedes the pain, it sometimes may; nay, if the child be still alive, it frequently may. Rest is absolutely necessary, if we wish the person to go to the full time: and it is occasionally necessary to confine her to bed for several weeks, at the same time that we put her upon an effective course of digitalis, and give an anodyne at bed-time, taking care also to keep the bowels in a proper state by gentle medicine. Blood ought also, unless the pulse and habit of the patient forbid it, to be detracted.

This is a very critical situation: much depends on the vigour and promptitude of our practice; and much, very much, upon the prudence of the patient. It is teazing to find that, sometimes after all our care and exertions, one rash act destroys in a single day the effect of the whole.

When we cannot prevent abortion, the next thing is to conduct the patient safely through the process; and the first point which naturally claims our attention, is the hemorrhage. Many practitioners, upon a general principle, bleed, in order to check this, and prevent miscarriage: but miscarriage cannot be prevented, if the uterine contraction have commenced; and the discharge cannot be prudently moderated by venesection, unless there be undue or strong action in the vessels; or much blood in the system; and if so, a vein may be opened with advantage.

This is not always the case, and therefore, unless the vessels be at or above the natural force or strength of action, the lancet is not at this stage necessary. The fulness and strength of the pulse are lost much sooner in abortion than can be explained, by the mere loss of blood.

It depends on an affection of the stomach, which has much influence on the pulse; and the proper time for bleeding is before this has taken place. When abortion has made so much progress before we are called, as to have rendered the pulse small and feeble; or when this is the case from the first, bleeding evidently can do no good.

Instead of this, we may use the digitalis, which I have already highly recommended as a preventive; but I do not say that, in ordinary cases, where the contraction is brisk, and the process quick, it is at this stage absolutely necessary; and I shall afterwards mention that, when the stomachic affection is urgent, and the pulse much affected by it, the use of this medicine is improper. When, however, the case is tedious, and the discharge long continued, at the same time that the sickness is not considerable, the digitalis * will be of essential service.

Nauseating doses of emetic medicines act in the same way with the digitalis, but are much less effectual, and more disagreeable, as well as uncertain in their operation.

Internal astringents have been proposed, but they have no effect, unless they excite sickness, which is a different operation from that which is expected from them.

The application of cloths dipped in cold water to the back and external parts will have a much better effect than internal astringents, and ought always to be had recourse to. If the digitalis have been exhibited, it assists that medicine in moderating the circulation.

Even when trusted to alone, it lessens the action of the sanguiferous system, particularly of the uterine vessels. The introduction of a small piece of smooth ice into the vagina, has been recommended, and has often a very speedy effect in retarding the hemorrhage, whilst it never, if properly managed, does any harm. A small snow-ball, wrapped in a bit of linen, will have the same effect; but neither of these must be continued so long as to produce pain, or much and prolonged shivering. The heat of the

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* The acetite of lead has been recommended by the ingenious and justly celebrated Dr. Rush of Philadelphia, in doses of from one to three grains, given three times a day. Of this practice I cannot speak from my own experience; but Dr. Rush informs me, that in his hands it has been attended with great success.

surface is also to be moderated, by having few bed clothes, and a free circulation of cool air.

But the most effectual local method of stopping the hemorrhage, is by plugging the vagina. This is best done by taking a pretty large piece of soft cloth, and dipping it in oil, and then wringing it gently.

It is to be introduced with the finger, portion after portion, until the lower part of the vagina be well filled. The remainder is then to be pressed firmly on the orifice, and held there for some time. This acts by giving the effused blood time to coagulate. It gives no pain; it produces no irritation, and those who condemn it, surely must either not have tried it, or have misapplied it.

If we believe that abortion requires for its completion a continued flow of blood, we ought not, in those cases where the process must go on, to have recourse to cold, or other means of restraining hemorrhage.

If we do not believe this, then surely the most effectual method of moderating it is the best. Plugging can never retard the process, nor prevent the expulsion of the ovum; for when the uterus contracts, it sends it down into the clotted blood in the upper part of the vagina, and the flooding ceases.

In obstinate cases we may, before introducing the plug, insert a little powdered ice, when it can be procured, tied up in a rag.

Faintness operates in the same way, in many cases, by allowing coagula to form in consequence of the blood flowing more slowly; and, when the faintness goes off, the coagula still restrain the hemorrhage in the same way as when the plug has been used. This naturally points out the advantage of using the plug, together with the digitalis, as we thus produce coagulation at the mouths of the vessels, and also diminish the vascular action. It will likewise show the impropriety of using injections at this time, for, by washing out the coagula, we do more harm than can be compensated by any astringent effect produced on the vessels.

The principal means, then, which we employ for restraining the hemorrhage, are bleeding, if the pulse be full and sharp; if not, we trust to the digitalis, stuffing the vagina, the application of cold to the external parts, keeping the heat of the body in general at a low temperature, and enforcing a state of absolute rest, which must be continued during the whole process, however long it may, in some cases, be. The drink should be cold, and the food, if the patient desires any, light, and taken in small portions.

Opiates have been advised, in order to abate the discharge, and are, by many, used in every case of abortion, and in every stage. But as we cannot finish the process without muscular contraction, and as they tend to suspend that, I do not see that their exhibition can be defended on rational principles.

If given in small quantity, they do no good in the present point of view; if in larger doses, they only postpone the evil, for they cannot check abortion after contraction has begun. Nothing can do this, for it proceeds from the cessation of the action of gestation, which we cannot restore.

But I will not argue against the use of opiates from their abuse. They are very useful in cases of threatened abortion, more especially in accidental separation of the membranes and consequent discharge. They do not directly preserve the action of gestation, but they prevent the tendency to muscular contraction, and thus do good; for we find in the animal economy, that when two actions oppose each other or alternate, preventing a tendency to the one has an effect in preserving the other. In weakly or emaciated habits, opiates alone, if given upon the first appearance of mischief, are often sufficient to prevent abortion; and in opposite conditions, when preceded by venesection, they are of great service.

Opiates are likewise useful for allaying those sympathetic pains about the bowels, and many of the nervous affections which precede or accompany abortion. They are also, especially if conjoined with digitalis, of much benefit, in cases where we have considerable and protracted discharge, with trifling pains, as the uterus is not contracting sufficiently to expel the ovum, but merely to separate vessels, and excite hemorrhe.

But suspending, for a time, its action, it returns afterwards with more vigour and perfection, and finishes the process. But when the process is going on regularly, opiates will only tend to interfere with it, and prolong the complaint.

It was, at one time, a very frequent practice to endeavour, with the finger or small forceps, to extract the fœtus and placenta, in order to stop the discharge. Puzos strongly opposed this practice, and it is now very properly given up as a general rule. I do not wish, however, to be understood as altogether forbidding manual assistance; but I am much inclined to consider it as a useful precept, not to be hasty in attempting to extract the ovum. If the discharge be protracted, and the membranes entire, we may, if the situation of the patient require it, sometimes accelerate expulsion, by evacuating the liquor amnii. But if the pregnancy be not advanced beyond the fourth month, it will be better to trust to smart clysters, and restrain the hemorrhage by means of the plug. We thus have a greater likelihood of getting all the ovum off at once, and may exite the action by gently dilating the os uteri, and moving the finger round it. If the membranes have given way, and the fœtus be still retained, we may, by insinuating a finger within the uterus cautiously, hook it out; or in many cases, it will be found partly expelled through the os uteri, and may easily be helped away. But the most tedious and troublesome case generally is that in which the fœtus has been expelled, but the secundines are still retained. Now, we never can consider the patient as secure from hemorrhage until these are thrown off, and therefore, she must be carefully watched, especially when gestation is considerably advanced. In a great majority of instances, the uterus, within a few hours, contracts and expels them. But in some cases the hemorrhage does become profuse, and there is little disposition to separate them. By stuffing the vagina, we shall often find that the discharge is safely stopped, and the womb excited to act in a short time. But if we be disappointed, or the symptoms urgent, the finger must be introduced within the uterus *, and the remains of the ovum slowly detached by very gentle motion; and we must be very careful not to endeavour to pull away the secundines until they are fully loosened, for we thus leave part behind, which sometimes gives a great deal of trouble; and farther, if we rashly endeavour to extract, we irritate the uterus, and are apt to excite inflammation, or a train of hysterical, and sometimes fatal symptoms. It is these two causes which make me cautious in advising manual assistance; and, fortunately, the proportion of cases requiring it is not great in abortion at an early period.

When part of the ovum is left, or the whole of the secundines are retained, then we have another danger besides hemorrhage; for, within a few days, putrefaction comes on, and much irritation is given to the system, until the fœtid substance be expelled. Sometimes, if gestation have not been far advanced, or the piece which is left is not very large, it continues to come away in small bits for many months; and during the whole time, the woman is languid, hysterical, and subject to irregularities of the menstrua, very often to obstruction; but more frequently the symptoms are very acute. We have loss of appetite, prostration of strength, tumid or tender belly, frequent small and sharp pulse, hot and parched state of the skin, of the hands and feet, nocturnal sweats, and various hysterical symptoms. The discharge from the vagina is abominably fœtid, and hemorrhage sometimes occurs to a violent degree †.

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* In some instances, the half of the secundines will be found in the vagina, and the other half still in the uterus. In this case, all that is necessary is gently to bring them out.

† This is especially apt to take place in those cases where the adhesion of the placenta to the uterus has been unusually firm. When, after being retained for some days, the connexion loosens, the detachment is generally attended with hemorrhage; and, if the separation should,

When this disease proves fatal, there are often, though not always, conjoined symptoms of gangrene, weak fluttering pulse, cold sweats, and hiccup.

The practice ought to be, to endeavour with the finger to loosen the putrid substance, and wash it out with tepid water thrown into the uterus by a syringe with a long pipe. The parts should be kept clean by injecting infusion of chamomile flowers, with a small quantity of oxygenated muriatic acid. The bowels should be kept open with gentle laxatives and clysters; the strength supported with light nourishment and small portions of wine, or tincture of bark frequently repeated. Plenty of subacid fruit may be allowed, and rest should be obtained, or irritation lessened by opiates. In the outset of the disease, emetics sometimes excite the expulsion of the uterine contents; but when the strength is much impaired, they are of more doubtful service *.

From these observations we may see upon the one hand the impropriety of allowing the secundines to remain too long in the uterus; and, on the other, the danger of making rash or unnecessary attempts to extract, by which we irritate the uterus, and tear the placenta, which is almost always productive of troublesome consequences. I now return to the consideration of the usual progress of abortion.

The stomach very soon suffers, and becomes debilitated, producing a general languor and feebleness, with a disposition to faint, which seems, in abortion, to depend more upon this cause than directly upon loss of blood. Indeed, the hemorrhage produces both slighter and less permanent effects in abortion than at the full time, although less blood may have been lost in the latter than in the former case,

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be complete, and expulsion take place, we can discover the spot which adhered longest by its difference of colour.

* The action of the uterus may sometimes be excited, and the placenta or decidua separated and thrown off by throwing cold water into the uterus by means of a female catheter, fitted to the elastic gum bottle used for injecting hydrocele.

for the vessels are smaller, and the discharge is not so sudden.

There is still another cause for this; namely, that the action of the uterus is less in the early than in the late months. Now, we know that the effect of hemorrhage from any organ is, *cæteris paribus*, in proportion to its degree of action. Hence the discharge is less dangerous than at the full time, and still less in menorrhagia than in abortion.

It is likewise less in cases where hydatids are contained in the uterus, than when a child is present; very astonishing discharges being sometimes sustained in that case with impunity; at the same time it must be observed, that all the discharge in these cases does not consist of pure blood, a great part of it being water proceeding from the bursting of the hydatids.

The effect of abortion on the stomach seems to be in proportion to the period at which that takes place, being greater when it occurs before the fourth month than after it.

The effect, though distressing, and often productive of alarm, is nevertheless beneficial, lessening the action of the vessels in the same way with digitalis, the use of which is improper when this condition is present.

The strength of the pulse is much abated; sometimes it becomes slower; but in general it remains much as formerly in point of frequency; we are, therefore, not to be too anxious in removing this condition, which restrains hemorrhage; yet as it may go beyond due bounds, and produce dangerous syncope, we must check it in time.

We must likewise be very attentive to the state of the discharge when this affection is considerable, for if, notwithstanding this, the hemorrhage should continue, it will produce greater and more immediately hurtful effects than if this were absent.

The best method of abating this sinking and feebleness, is to keep the body perfectly at rest, and the head low. If necessary, we give small quantities of stomachic cordials, such as a little tincture of cinnamon, or a few drops of ether in a glass of aerated water; or we may give a little peppermint water, with fifteen drops of tincture of opium. In urgent cases, Madeira or undiluted brandy may be given; but these are not to be frequently repeated, and are very rarely necessary.

Sometimes instead of a feeling of sinking and faintness, the fibres of the stomach are thrown into a spasmodic contraction, producing sudden and violent pain. This is a most alarming symptom, and may kill the patient very unexpectedly. It is to be instantly attacked by a mixture of sulphuric ether and tincture of opium, in a full dose, whilst a senapism is applied to the epigastric region; but if, when this pain occurs, there be symptoms of approaching convulsions, then bleeding should precede the anodyne, and no ether should be given.

Spasms about the intestines are more frequent, and much less dangerous. They are very readily relieved by thirty drops of tincture of opium, in a dessert spoonful of aromatic tincture, or forty drops of the tincture of hyocyamus in two tea-spoonfuls of the compound tincture of lavender.

The brain may also be affected, producing epilepsy; which is a very dangerous symptom. This is sometimes preceded by head-ach, flushing of the face, and feeling of fulness about the head and neck; but at other times it attacks without any precursory symptom, and sometimes seems to arise directly from copious hemorrhage.

Nothing can be done to the uterus in the way of manual assistance, or extracting the ovum, in the first three months of gestation, (unless the os uteri be fully open, in which case the fœtus may easily be slipped out with the finger;) but our chief attention should be directed to the brain. It will, indeed, be proper to attend to the state of the pains and discharge. If the latter be profuse, we must take measures to check it; if the former be absent, or seem to alternate with the convulsions, we may derive advantage from the use of a saline clyster, which will excite the contraction of the uterus, and confine the action more to itself; or enable us soon, and without any irritation, to extract the fœtus, which ought in general to be done whenever the period of gestation, or the state of the uterus will permit it.

The same effect may sometimes be obtained by injecting cold water into the os uteri. Whilst we thus endeavour to excite the regular action of the uterus, we must likewise act directly on the brain, by shaving the head, and applying a senapism to the scalp. We also detract blood, if the pulse indicate an evacuation; which will always be the case unless the flooding have been copious; and, when we do bleed, we should bleed freely. If, on the other hand, the disease seem to have arisen from the profusion of the discharge, it will be proper to give volatiles, or a full dose of laudanum, in a little warm brandy.

In those cases where convulsions accompany abortion after the fourth month, it will be proper after the contraction of the uterus is fully established[*], to endeavour to co-operate with the expulsive efforts of the womb, by very cautious manual assistance; and these endeavours, if the convulsions have not arisen from loss of blood, ought to be preceded by liberal evacuations. It is proper to distinguish carefully betwixt these two states; for, in the one case, the disease is entirely connected with the state of the uterus; in the other it is chiefly dependent on loss of blood; and, in some, a comparatively small discharge is sufficient to produce it.

Epilepsy is to be distinguished from a combination of hysteria and syncope, which occasionally occurs, during labour, whether natural or premature, and which is by no means equally dangerous.

This is known by the smallness of the pulse, the paleness of the face, the slightness of the convulsions, the absence of foam at the mouth, and an appearance of struggling about the throat. It attacks suddenly, generally on getting into an erect posture.

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[*] Convulsions sometimes take place in the pregnant state, without any tendency to abortion; or, at least, without symptoms of contraction. Sometimes a slight discharge succeeds or accompanies the convulsions; but if the patient be bled, and kept quiet, she goes on to the full time, but is in danger of being seized with convulsions in the course of labour.

It is at first little different from syncope, and during the whole time the muscles of the face are not much affected, the countenance having rather a deadly aspect. This is removed by an horizontal posture, sprinkling the face smartly with cold water, and the use of volatiles. The patient, in this case, as in epilepsy, is often unconscious of having been ill.

Regular hysteric paroxysms also sometimes accompany abortion, and are more dangerous than at other times, more especially if they seem to have been excited by the profusion of the discharge. If they last long, they either end in mortal syncope, or in stupor. If they have been brought on by some agitation of mind, they are less to be feared, though not even then void of danger.

Besides attending to the state of the discharge, the best practice is to keep the person very cool, and exhibit thirty or forty drops of tincture of opium, and two drams of tinctura valerianæ ammoniata in a little peppermint water. A clyster, composed of a pound of cold water, and two drams of tincture of assafœtida, is also sometimes of service.

Those disagreeable symptoms which I have described, fortunately do not often attend abortion; but the process goes on safely, and without disturbance. In this case, after it is over, we only find it necessary to confine the person to bed for a few days, as getting up too soon is apt to produce debilitating discharge.

We must also, by proper treatment, remove any morbid symptoms which may be present, but which, depending on the peculiarities of individuals, or their previous state of health, cannot here be specified. When the patient continues weakly, the use of the cold bath, and sometimes of the bark, will be of much service in restoring the strength; and in future pregnancies, great care must be taken that abortion may not happen again at the same period.

Unfortunately we meet with some cases where the recovery does not take place with that promptitude and regularity which could be wished. This sometimes depends upon a continuance of the hemorrhage after the ovum is expelled, by which the patient is greatly weakened, and even her life put into danger.

The hemorrhage may either continue from the time of expulsion, or it may come on a week, or even longer, after it. It seems to proceed from the uterus not going on in the process of restoration to the unimpregnated state, but remaining too long enlarged, the consequence of which is, that very soon the vessels pour out blood, and fill the cavity, forming a coagulum, which presently is expelled with a considerable flow of fluid blood; and this process may be very frequently repeated.

This, which is often connected with an hysterical condition, is more especially apt to occur in those who are subject to flooding after the expulsion of the child, as this marks a natural feebleness in the womb, and a disposition to flag in its actions after delivery.

This disease may take place at any period of gestation; it may follow abortion in the second month, or expulsion at the full time; it is most frequent, however, in the early months, but most dangerous in the latter; it may attack only once or twice, or it may be often renewed for many weeks, and it is wonderful how the system can be supported under these repeated discharges, but we find that an incredible quantity of blood may be lost if it be taken away at intervals.

Each paroxyism is accompanied by slight pain in the back and belly, with considerable languor and depression of spirits. The discharge continues until the clot escapes out of the uterus, and for some time after that, until a new coagulum forms in the cavity of the uterus which has not fully contracted; and during this last process we have a considerable oozing of serum.

This disease is not easily distinguished from the repeated hemorrhage which sometimes attends the retention of part of the secundines; but we may be assisted by observing that the clot which is discharged is generally firm, and possesses exactly the shape of the uterine cavity, showing that no substance is adhering to its surface. No portions of organized or fibrous substance are discharged, and the putrid smell attending the disease proceeds evidently from the clot, which is sometimes retained for five or six days in the womb. This complaint either terminates fatally by a convulsion, or by syncope, or the uterus contracts more briskly, and speedily regains the proper size for the unimpregnated state. If any small coagulum shall form after the brisk contraction which rouses the uterus to its healthy action, it gradually breaks down, and is expelled with the cleansings.

In abortion, during the early stages of gestation, we cannot take any other precaution to prevent this, than keeping the patient for some time very quiet, as motion, or even any agitation of mind, might interfere with the process of recovery.

In more advanced gestation, as, for instance, in the seventh month, and afterwards, if we should be obliged, on account of flooding, after the birth of the child, to introduce the hand, and extract the placenta, we must be careful not to withdraw it, until we find the uterus contracting round it, which will be a mean, though not an infallible one, of making it go regularly on in the process of restoration to the unimpregnated state.

The best method of treating this complaint, is, on the very first appearance of hemorrhage, to introduce a firm plug into the vagina, which will prevent it from going to an excessive degree. Afterwards we must take measures to prevent a return.

This is best done by keeping the circulation slow, by means of the digitalis, and putting the patient on a mild vegetable diet. We cannot assist the process of restoration otherwise than by endeavouring to excite the contraction of the uterus. This may be done by injecting an astringent fluid two or three times a day, and by ordering saline clysters, which have also the effect of keeping the bowels open, an object of very great importance. We may also find it useful to excite gentle vomiting by small doses of ipecacuanha.

This has an excellent effect in making the uterus contract, and often is the method which nature takes to bring about recovery.

This complaint is different from the menorrhagia lochialis, or copious discharge of blood brought on by exertion after abortion or delivery, at the full time *. In this case we have no large clot discharged, but just the usual appearances of menorrhagia. This sometimes seems to become associated with other morbid conditions of the system: and in those cases is more or less obstinate as they are intractable. It is generally cured by rest, the application of cold, and the use of the digitalis, if the pulse be frequent. The consequent weakness is removed by bark, or preparations of iron, with the cold bath.

Either of these discharges are very apt to produce painful head-achs, vertigo, and often slight paralytic symptoms, which, however, soon go off. Any considerable increase of the hemorrhage gives relief to the head-ach, but it returns afterwards with greater violence.

It is frequently relieved by the use of small doses of the saline laxatives. In protracted cases, especially when the head-ach puts on an intermittent form, observing pretty regular periods, the bark combined with valerian, will be of service.

Sometimes the mind is affected after abortion, although we may have had little discharge; and the person becomes either melancholy, or, which is much oftener the case, mad,

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* In some cases, however, exertion speedily after abortion or childbirth does interfere with the action of the uterus, and prevent it from going on in the process of diminution with regularity. In these instances, clots are discharged with hemorrhage, and these often pass for moles or false conceptions, or portions of the secundines.

with great volubility of tongue. This mania is, in general, sudden in its attack, and is often preceded by a violent fit of palpitation, or some other nervous affection.

It occasionally alternates with external pain or swelling of some of the joints; and, though frequently a tedious complaint, is oftener got the better of than any other species of mania. The head, upon a general principle, ought to be shaved and blistered, and a free discharge kept up from it. The bowels are to be carefully attended to, and no indurated fœces should be allowed to remain in them. The camphorated emulsion may be given through the day in its usual quantity; and a full dose of extract of hyoscyamus exhibited at night. The patient is to be kept, in every respect, as quiet and easy as possible.

When there is a permanent confusion of the head, or deep pulsating pain, or feeling of contraction; when the patient becomes restless, the eye sparkling, the pulse frequent, and delirium supervenes, the case is much worse, for the brain is inflamed, and nothing but the most prompt and liberal evacuation can save the patient. This disease rarely succeeds abortion, but sometimes follows premature labour.

Another distressing consequence of abortion, as well as of labour at the full time, is hysteria appearing in various forms, but more especially under that of palpitation of the heart. This attacks suddenly, often in consequence of a fright.

The patient has a violent beating in the breast, and sometimes a sense of suffocation. She feels also a knocking within the head, attended with a sense of heat, and often a redness in the face. The pulse becomes extremely rapid and irregular, and continues so until the fit goes off, which sometimes is not for a considerable time.

During the paroxysm, the patient is much terrified, and impressed with a belief that she is going to die. After it is over, the mind is left timid, and the body in a state of languor. Sometimes the fit is succeeded by a profuse perspiration, whilst betwixt the attacks, the temperature is very versatile.

This, like all other complaints of the same class, is very obstinate; but it is not in general dangerous *, unless when it proceeds from uterine disease, marked by pain in the hypogastric region and tension of the belly. In this case, the danger is great, and is only to be averted by the early use of purgatives, followed by antispasmodics, whilst fomentations are applied to the belly.

The other case, which is purely hysterical, is to be relieved by giving, during the paroxysm, a liberal dose of tincture of opium and ether. Small doses have no effect. During the intervals, we may give a table-spoonful of the following mixture five or six times a day.

℞ Tinc. digitalis ʒiss.
Tinc. Hyoscyami ʒi.
Emuls. Camphorat. ℥iv. misce.

It is also an essential point, that the bowels be kept open, and the patient put upon a light diet. As the attacks are very apt to come on at night, when the person is about to fall asleep, we sometimes find it useful to give a dose of tincture of hyoscyamus and ether at bed-time, and must take great care that the patient be not afterwards disturbed or put off her rest.

When she is much troubled with flatulence, during the intervals the tinctura valerianæ ammoniata is of considerable service. Tonics and the cold bath are also proper. Hysteria either consists in or depends upon a preternatural aptitude in the different organs, to have their actions morbidly increased, or rendered irregular; and hence it may affect secreting as well as muscular parts; and many of the dis-

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* When the patient is predisposed to pulmonic disease, violent palpitation, especially if accompanied or succeeded by the febrile state, to be afterwards noticed, may excite consumption, which in this case sometimes proves rapidly fatal.

charges of lying-in women will be found to be, in this sense, hysterical, and to alternate with other symptoms, such as globus, palpitation, head-ach, &c. and even the most troublesome of all the discharges, that proceeding from the uterus not recovering or contracting properly, is, I believe, properly speaking, an hysterical affection, connected with several others, and alternating with them.

The next disease which I shall mention, is, also, I believe, altogether hysterical. I mean that resemblance of fever which is often met with after either abortion or delivery, at the full time, and which is, like the rest of its tribe, abundantly obstinate.

This is not to be confounded with milk-fever, or other general diseases arising from local injury. It is sometimes preceded by palpitation, frightful dreams, and other nervous affections *. At other times it attacks directly with a shivering fit, which is soon alternated with heat, then the heat becomes steady and distressing, and continues until a profuse perspiration carries it off.

The head is generally pained in the two first stages, and the pulse is frequent in them all. The thirst is considerable, the stomach filled with flatus, and the belly bound. Often we have irregular action of the heart occurring in all the stages, whilst the mind is weakened, and the patient is much afraid of dying. The paroxysm continues for several hours, and, like ague, is apt to return regularly for a length of time.

In the cold stage, we give small quantities of warm fluid. In the hot stage, we lessen the number of bed-clothes; but must not do this suddenly, as the shivering is very apt, in either this or the sweating stage, to return, upon slight exposure to cold. We also give small quantities of tepid

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* Hiccup sometimes accompanies this complaint: at other times it attacks the patient as a disease by itself, or alternates with palpitation. It is best treated by giving large doses of ether. It is also necessary to clear the bowels; afterwards the compound tincture of bark is useful.

fluid, in order to hasten the accession of the concluding stage.

In the last stage, we are careful not to encourage the perspiration too much, by refraining from warm drink, for much sweating only tends to render the disease more obstinate. A repetition is to be prevented, by keeping the bowels open, by the use of the bark, conjoined with antispasmodics, and by carrying the patient, as soon as possible, to the country.

FINIS.

PRACTICAL OBSERVATIONS

ON THE

UTERINE HEMORRHAGE;

WITH

REMARKS

ON THE

MANAGEMENT OF THE PLACENTA.

BY JOHN BURNS,

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TO

ALEXANDER MONRO, JUN. M. D.

PROFESSOR OF ANATOMY,

IN THE

UNIVERSITY OF EDINBURGH,

THE

FOLLOWING PAGES

ARE MOST RESPECTFULLY DEDICATED,

AS A SMALL

TESTIMONY OF THE ESTEEM

WHICH THE AUTHOR ENTERTAINS

FOR HIS

PROFESSIONAL ABILITIES,

AND FOR HIS

PRIVATE FRIENDSHIP.

PRACTICAL OBSERVATIONS, *&c.*

OF all the accidents to which a pregnant woman is exposed, none is more alarming or troublesome than uterine hemorrhage, when it occurs in the advanced stages of gestation, or after the delivery of the child. This, from its extent and impetuosity, has aptly been called a flooding; and from the frequency of its occurrence, it must be extremely interesting to every practitioner.

The ovum is connected with the uterus by means of a vast multitude of delicate vessels, which pass almost at every point from the one to the other. These vessels are large where the placenta is attached; smaller where they pass into the decidua.

As the ovum corresponds exactly to the inner surface of the uterus, and is in close and intimate contact with it, we find that as long as this union subsists, the vessels, notwithstanding their delicacy, are enabled to transmit blood without effusion. But whenever a separation of the one from the other takes place, then these vessels are either directly torn, or, even supposing them to extend a little, they must be ruptured by their own action; or, by the force of the blood which they receive and circulate. When this happens, an extravasation or discharge must be the consequence, which will be greater or smaller in proportion to the number and magnitude of the vessels which have given way, and the strength of the action, which exists in the sanguiferous system.

The membranes are never so full of water as to be put upon the stretch, and therefore they cannot forcibly distend the womb, and make pressure on its inner surface. The womb again, during gestation, does not embrace the membranes tightly, so as to compress them. Hence it is evident, that when rupture first takes place, no resistance can, by the action of the one upon the other, be afforded to the flow of the blood. The consequence of uterine hemorrhage, when considerable, is, that the force of the circulation is diminished; faintness or absolute syncope being induced. The blood in this state flows more feebly. Coagulation is allowed to take place, and the paroxysm is for the present ended. Re-union, however, when the separation is extensive, and the coagulum considerable, cannot be expected to take place; and, therefore, when the clot loosens, a return of the hemorrhage is in general to be looked for.

One or more copious discharges of blood must injure the functions of the uterus, and ultimately destroy altogether the action of gestation. This tends to excite the muscular action of the uterine fibres; and by their contraction two effects will be produced. The uterine vessels will be diminished in their diameter or capacity, and the whole surface of the womb pressing more strongly upon the ovum, a greater resistance will be given to the flow of the blood.

Thus it appears, that nature attempts to save the patient in two ways. First, by the induction of a state of faintness, or sometimes of complete syncope, which tends to check the present attack. Secondly, when the hemorrhage is so great or obstinate as to prevent any possibility of the woman going safely to the full time, such effects are produced as tend to establish muscular contraction, and accelerate expulsion. This double process ought, in all our reasonings, to be held in view.

Uterine contraction is of two kinds, which may be called permanent and temporary. The permanent is that continued action of the individual fibres by which the uterus is.

rendered tense, so that it feels hard if the hand be introduced into its cavity. The temporary is that greater contraction which is excited at intervals for the expulsion of the fœtus, producing what are called the pains of labour.

In those cases where nature effects a cure by expulsion, or the production of labour, it is chiefly to the permanent or tonic contraction that we are indebted for the stoppage of hemorrhage; because this contraction lessens the size of the vessels, and keeps up a firm pressure of the uterine surface upon the ovum, until the pains have accomplished the expulsion or delivery of the child. The pains alone could not do this good; for, coming only at intervals, their effect would be fugacious. On the other hand, the permanent contraction would not be adequate to the purpose without the pains; for these temporary paroxysms excite this action to a stronger degree, and by ultimately forcing down the child, accomplish delivery before the powers of the uterus be worn out.

Such are the steps by which the patient is naturally saved. But we are not to expect that these shall in every instance, or in a majority of instances, take place at the proper time, or in the due degree. The debility and syncope may go too far, or the clots may not form in proper time, or may come away too soon, or too easily. The action of gestation may continue, notwithstanding the violence of the hemorrhage. Thus preventing the accession of muscular contraction, or before this contraction be established and the child expelled, the discharge may have been so great and constant, as to render the efforts of the womb weak and inefficient; and by still continuing, may destroy them altogether.

These circumstances being considered, it will be evident, that although when the injury is small, and the discharge trifling, nature may permanently check it; or, in more serious cases, may preserve the woman by the expulsion of the child; yet we cannot, with prudence, place our whole reliance on her unassisted operations.

There is also another circumstance relating to a particular species of flooding, which renders the accomplishment of a natural cure or escape still more doubtful. This is, that the placenta is sometimes attached to the os uteri, which necessarily must produce a hemorrhage whenever the cervix comes to be fully developed, and the mouth to open.

The vessels going to the placenta are much larger than those which enter the decidua; and, therefore, if part of the placenta be detached, the quantity and velocity of the discharge must be greater, and the effects more to be dreaded, than when a part of the decidua alone is separated. If the placenta be fixed near the cervix uteri, and a part of it be detached, then the blood which is effused will separate the membranes down to the os uteri, and a profuse hemorrhage will appear. But sometimes if it be fixed to the fundus uteri, the blood may be confined, especially if the separation have been trifling, and a coagulum will be formed exterior to the membranes; the lower part of which will still adhere to the uterus; or if the central portion of the placenta have been detached, a collection of blood may be formed behind it, but may not extend beyond its circular margin *. But if the placenta be placed over the os uteri, then the case is different, profuse discharge will take place, sinking the whole system, and very much enfeebling the uterus itself, so that when uterine contraction does come on, it will be weak, and incapable of speedily effecting expulsion, even although the contraction should be brisk and powerful, it cannot, owing to the structure of the placenta, do the same good as in other cases of flooding; and, therefore, in every instance, much blood will be lost, and in many, in very many, the patient, if we trust to this contraction alone, will perish. The

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* An important case of this kind is related by Albinus. Vide Acad. Annot. lib. i. p. 56. Some cases are also mentioned by M. Baudelocque. In one of these the womb was considerably distended. Afterwards slight pains came on, some clots were discharged, and the woman became very weak: she was then delivered without success. Vide System, &c. part iii. chap. i.

cells of the placenta communicate with each other, and blood sent into it at one part by the uterine vessels, may escape by that part which is over the os uteri, and which being separated from it, is consequently unsupported. Contraction can only be expected in this case to do good, when it is powerful, and the pains come on so briskly, as speedily to empty the uterus at the same time that coagula shut the mouths of the placental vessels at the unsupported part.

It has been a common opinion, that flooding proceeded always from the detachment of part of the placenta; but this point is not established*. In several cases of uterine hemorrhage, the placenta will be found attached to the fundus uteri; and we cannot suppose, that in all of these, the whole extent of the membranes, from the placenta to the os uteri, has been separated: yet, this must happen, before discharge can in these circumstances appear. We can often account for the hemorrhage, by supposing a portion of the decidua to be detached; and we know that the vessels about the cervix, are sufficiently able to throw out a considerable quantity of blood, if their mouths be opened.

OF THE CAUSES OF UTERINE HEMORRHAGE.

LET us next consider the causes † giving rise to hemorrhage in various degrees; and the first which I shall mention, is external violence, producing a separation of part of the ovum. As the ovum and uterus correspond exactly to each other, and are, in the advanced stages of gestation, composed of pretty pliable materials, falls or blows, will not produce laceration, so frequently as might be supposed. In a majority of instances, the effect is produced chiefly by the operation on the vessels, their action being violently and suddenly excited, and rupture of their coats thus produced. When the ovum is mechanically detached, the injury must have been considerable, and in general the fœtus is destroyed.

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* Long ago, Andrea Pasta questioned the opinion, that flooding was always produced by separation of the placenta. Vide Discorso del flusso di sangue, &c. We are not, however, to suppose, that hemorrhage does not proceed from detachment of the placenta in any instance, when it is placed high up, but only that it is a rare occurrence. When the stream is rapid and profuse, we have every reason to suppose, that part of the placenta is separated; but if we have occasion to deliver, it will generally be found that it is placed close by the cervix uteri, or at least not very far from it.

† I purposely exclude, at present, the consideration of all those he-

Secondly. Fatigue, or much exertion, may, upon principles which I have noticed in another publication*, injure the action of the uterus, and give rise to premature expulsion, which in this case is generally attended with considerable discharge. Such exertions are likewise apt, by their effect on the circulation, to operate on the vessels passing to the ovum, and produce in them a greater degree of activity, than they are capable of sustaining without rupture. It is, therefore, very properly laid down as a rule of practice, to forbid pregnant women to undergo much fatigue, or exert any great muscular action; and wherever this rule has been departed from, especially by a patient of an irritable or of a plethoric habit, it behoves the practitioner to attend carefully to the first appearances of injury, or to the first symptoms of decay in the uterine action. Rest and an opiate will, upon general principles, be indicated, and when the circulation is affected, or we apprehend increased action about the uterine vessels, venesection must be premised, and the patient kept cool and tranquil.

Violent straining at stool, or strong exertions of the abdominal muscles, made in lifting heavy bodies, or in

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morrhages, arising from polypi, or other diseases of the uterus. I mention this, to put the student on his guard against those discharges, and to advise him to attend to the proper diagnostics.

* Vide Observations on Abortion.

stretching to a height, or frequent and continued stooping, may all, by compressing the womb, cause separation. For the greatest effect will be produced, where the resistance is least, or the support smallest, which is at the under part of the uterus, and there rupture will be apt to take place.

Thirdly. A preternatural degree of action in the vessels going to the placenta or decidua, must be dangerous, and likely to produce rupture, and extravasation. This may either be connected with a general state of the vascular system, marked by plethora, or by arterial irritation; or it may be more immediately dependent on the state of the uterus itself.

When the woman is plethoric, or when the action of the vascular system is increased, it is natural to suppose that the effect will be greatest on those parts of the womb which are in the highest state of activity. These are chiefly two: the part to which the placenta is attached, for there the vessels are large and numerous; and the cervix and os uteri, because there the greatest changes are going forward. At one or other of these two places, rupture is most likely to take place, and it will happen still more readily, if the placenta be attached at, or near to the cervix. It may be excited either by too much blood circulating permanently in the system, or by a temporary increase of the strength and velocity of the circulation produced by passion, agitation, stimulants, &c. A plethoric state, is a frequent cause of hemorrhage in the young, the vigorous, and the active: the decidua is separated, and a considerable quantity of blood flows; perhaps the placenta is detached, and the hemorrhage is more alarming. In some cases, the rupture is preceded by spitting of blood, or bleeding at the nose, and in these cases, the lancet may be of much service.

We sometimes find, that extravasation is produced by an increased action of the uterine vessels themselves, existing as a local disease. In this case the patient, for some time before the attack, feels a weight and uneasy sensation about the hypogastric region, with slight darting pains about the belly or back. These precursors have generally been ascribed to a different cause; namely, rigidity of the ligaments of the womb, or of the fibres of the uterus itself.

IV. A want of correspondence betwixt the action of the uterus and the ovum, or a disproportion in the relative strength of their vessels, may produce rupture; for if the connecting vessels be unable easily to bear the transmission of blood from the uterus, it is evident, that any slight irregularity, or increase of the force of the blood, must destroy the parts.

V. Spasmodic action about the os uteri, must produce a separation of the connecting vessels. The causes giving rise to this in the advanced period of gestation, are not always obvious, neither can we readily determine the precise cases in which this action excites flooding. We should expect that the discharge ought always to be preceded by pain, but we know that motion may take place in some instances about the os uteri, without much sensation; and on the other hand, many cases of flooding not dependent on motion of the uterine fibres, are attended with uneasiness or irregular pain about the abdomen. This spasmodic action, is not unfrequently produced, by hanging pregnant animals.

VI. Whatever stops, prematurely, the action of gestation, may give rise to a greater or less degree of hemorrhage. For in this case, the developement of the cervix takes place quickly, and the ovum must be separated. The quantity of the discharge * will depend upon the state of the circulation—the magnitude of the vessels which are torn—the contraction of the uterus—and the care which is taken of the patient. Hence it follows as a rule in every premature labour, more especially in its first stage, that we prevent all

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* In those cases where the contraction becomes universal and effective, we have little discharge, and the patient is merely said to have a premature labour; but if the contraction be partial, and do not soon become effective, then we have considerable discharge, and the patient is said to have a flooding.

exertion, refrain from the use of stimulants, and confine the patient to a recumbent posture.

It sometimes happens, that effective contraction does not take place speedily after the action of gestation ceases, but a discharge appears. This may stop by the induction of syncope, or the formation of clots. The blood which is retained about the cervix and os uteri, putrefying, produces a very offensive smell. Milk is secreted as if delivery had taken place, and sometimes fever is excited. In this state, the patient may remain for some days, when the hemorrhage is renewed, and the patient may be lost, if we do not interfere.

VII. Some undue state of action about the os uteri, removing, or ceasing to form that jelly which naturally ought to be secreted there.

This is generally productive of a discharge of watery fluid, tinged with blood; and if the patient be not careful, pure blood may be thrown out in considerable quantity. It may even happen that the hemorrhage, under certain circumstances, may prove fatal; and yet, upon dissection, no separation of the ovum be discovered, the discharge taking place from the vessels about the os uteri itself*.

VIII. In some instances, where a portion of the placenta has been detached, I have observed that near the separated part, the structure of the placenta was morbid, being hard and gristly. In these cases I could not detect any other cause of separation, and suppose that by the accidental pressure of the child upon the indurated part, the uterus may have been irritated.

IX. The insertion of the placenta over the os uteri †, may give rise to flooding in different ways.

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* Vide a case in point, by M. Heinigke, in the first volume of Brewer's Biblioth. Germ.

† So far as I have observed, uterine hemorrhage, when profuse, is produced most frequently by this cause; at least, two thirds of those cases requiring delivery, proceed, I think, from the presentation of the pla-

The uterus and placenta may remain in contact until the term of natural labour, the one adapting itself to the other; but whenever the os uteri begins to dilate, separation and consequent hemorrhage must take place.

It is rare, however, for the accident to be postponed so long. In general, at an earlier period, in the eighth month, for instance, we find that either the uterus and placenta no longer grow equally; in consequence of which, the fibres about the os uteri are irritated to act, or so much blood as must necessarily, in this situation, circulate about the cervix uteri, interferes with its regular actions, and induces premature contraction of its fibres, with a consequent separation of the connecting vessels.

In order to ascertain whether the hemorrhage proceed from this cause, we ought, in every case to which we are called, carefully to examine our patient. The introduction of the finger is often sufficient for this purpose, but sometimes it may be necessary to carry the whole hand into the vagina.

If the placenta prevent, we shall feel the lower part of the uterus thicker than usual, and the child cannot be so distinctly perceived to rest upon it. This is ascertained by pressing with the finger on the fore part of the cervix, betwixt the os uteri and bladder, and also a little to either side *.

If the os uteri be a little open, then, by insinuating the finger, and carrying it through the small clots, we may rea-

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centa; and in the majority of the remaining third, it will be found attached near to the cervix. Most of those hemorrhages which are cured without delivery, proceed from the detachment of the decidua alone, or of a very small portion of the placenta, which has been separated under circumstances favourable for firm coagulation.

* When a large coagulum occupies the lower part of the uterus, we may be deceived if we trust to external feeling alone, without introducing the finger within the os uteri. If the uterus have its usual feel, and the child be felt distinctly through it, then we are sure that, however near the placenta may be to the os uteri, it is not fixed over it.

dily ascertain whether the placenta or membranes present, by attending to the difference which exists betwixt them. But in this examination, we must recollect that only a small portion of the edge of the placenta may present, and this may not readily be felt at first.

To conclude this section, I remark in general, that hemorrhage from the uterus is not merely arterial, but also venous, and the orifices of these latter vessels are extremely large. Almost immediately after conception, the veins enlarge and dilate, contributing greatly to give to the uterus the doughy feel which it possesses. In the end of gestation, the sinuses are of immense size, and their extremities so large, that in many places they will admit the point of the finger. Now, as all the veins communicate more freely than the arteries, and as they have in the uterus no valves, we can easily conceive the rapidity with which discharge will take place, and the necessity of encouraging coagulation, which checks venous still more readily than arterial hemorrhage.

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OF THE EFFECTS OF UTERINE HEMORRHAGE.

IN whatever way flooding is produced, it has a tendency to injure or distress gestation, and to excite expulsion; but these effects may be very slowly accomplished, and in a great many instances may not take place in time to save the patient or her child. Having already noticed these changes produced on the womb itself by hemorrhage, and the danger of trusting to them for the recovery of the patient, I will not recapitulate, but proceed very shortly to mention the effects produced on the system at large.

During the continuance of the hemorrhage, or by the repetition of the paroxysms, certain alterations highly important are taking place. There is much less blood circulating than formerly; and this blood, when the hemorrhage has been frequently renewed; is less stimulating in its properties, and less capable of affording energy to the brain and nerves.

The consequence of this is, that all the actions of the system must be performed more languidly, and with less strength. The body is much more irritable than formerly, and slight impressions produce greater effects. This gives rise to many hysterical, and sometimes even to convulsive affections.

The stomach cannot so readily digest the food—the intestines become more sluggish—the heart beats more feebly—the arteries act with little force—the muscular fibre contracts weakly—the whole system descends in the scale of action, and must, if the expression be allowable, move in an inferior sphere.

In this state, very slight additional injury will sink the system irreparably—very trifling causes will unhinge its actions, and render them irregular. If the debility be carried to a degree farther, no care can recruit the system—no means can renew the vigour of the uterus. We may stop the hemorrhage, but recovery will not take place. We may deliver the child, but the womb will not contract. If when the system is debilitated by hemorrhage, some irritation be conjoined, then the vascular action becomes more or less irregular, and an approximation is made to a state of fever. The pulse is feeble, but sharp; the skin rather warm; and the tongue more or less parched. This state is dangerous, both as it exhausts still more a system already very feeble, and also as it tends to renew the hemorrhage. It will often be found to depend upon slight uterine irritation, upon accumulation in the bowels, upon pulmonic affections, upon muscular pain, or upon the injudicious application of stimuli.

Such organs as have been previously disposed to disease, or have been directly or indirectly injured during the continuance of protracted flooding, may come to excite irritation, and give considerable trouble.

An acute attack of hemorrhage generally leaves the patient in a state of simple weakness; but if the discharge be allowed to be frequently renewed, and the case thus protracted, some irritation often comes to be conjoined, which adds to the danger, and excites, if the patient be not delivered, more speedy returns.

OF THE PROGNOSIS.

WE may lay it down as a general observation, that few cases of profuse hemorrhage, occurring in an advanced stage of gestation, can be cured without delivery, or the expulsion of the child. For when the discharge is copious or obstinate, the placenta is generally separated, sometimes to a very considerable extent, and a re-union, without which the woman can never be secure against another attack, can rarely be expected. If the placenta present, the hemorrhage, although suspended, will yet to a certainty return, and few will survive if the child be not delivered.

But in those cases where only a portion of the decidua or a little bit of the margin of the placenta * has been detached, and the communicating vessels opened, either by a state of over action in the vascular system, or by too much blood in the vessels, or by some mechanical exertion; then, if proper care be taken, the hemorrhage may be completely, and permanently checked; or if it should return, it may be kept so much under, or may consist so much of watery discharge from the glands about the os uteri, as neither to in-

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* In this case, after labour is over, we may discover the separated portion by the difference of colour; it is generally browner and softer than the rest.

terfere with gestation, nor injure the constitution; yet it is to be recollected, that even these cases of flooding, may sometimes proceed to a dangerous degree, requiring very active and decided means to be used; and in no case can the patient be considered as safe, unless the utmost care and attention be paid to her conduct.

It would thus appear, that some hemorrhages almost inevitably end either in the delivery of the child, or the death of the parent; whilst others may be checked or moderated without an operation. A precise diagnostic line, liable to no exceptions, cannot be drawn betwixt those cases; and, therefore, whilst we believe that rapid and profuse hemorrhages, which indicate the rupture of large vessels, can seldom be permanently checked, we still, provided the placenta do not present, are not altogether without hopes of that termination, which is more desirable for the mother, and safer for the child, than premature delivery. In slighter cases, our hope is joined with some degree of confidence.

A second attack, especially if it follow soon after the first, and from a slight cause, greatly diminishes the hope of carrying the woman to a happy conclusion, without manual interference.

In forming our opinion respecting the immediate danger of the patient, we must consider her habit of body, and the previous state of her constitution. We must attend to the state of the pulse, connecting that in our mind with the quantity and rapidity of the discharge.

A feeble pulse, with a hemorrhage, moderate in regard to quantity and velocity, will, if the patient have been previously in good health, generally be found to depend on some cause, the continuance of which is only temporary.

But when the weakness of the pulse proceeds from profuse or repeated hemorrhage, then, although it may sometimes be rendered still more feeble by oppression, or feeling of sinking at the stomach; yet, when this is relieved, it does not become firm. It is easily compressed, and easily stopped by motion; or sometimes, even by raising the head.

If the paroxysm is to prove fatal, the debility increases—the pulse flutters—the whole body becomes cold and clammy—the breathing is performed with a sigh—and syncope closes the scene.

If irritation be conjoined with hemorrhage, then the pulse is sharper, and, although death be near, it is felt more distinctly than when irritation is absent.

The termination in this case is often more sudden, than a person unacquainted with the effect of pain or irritation on the pulse, would suppose. For when the pulsation is distinct, and even apparently somewhat firm, a slight increase of the discharge, or sometimes an exertion without discharge, speedily stops it, the heat departs, and the patient never gets the better of the attack.

We must likewise remember, that a discharge, which takes place gradually, can be better sustained than a smaller quantity, which flows more rapidly. For the vessels in the former case come to be accustomed to the change, and are able more easily to accommodate themselves to the decreased quantity. But when blood is lost rapidly, then very speedy and universal contraction is required in the vascular system, in order that it may adjust itself to its contents, and this is always a debilitating process. The difference too betwixt the former and the present condition of the body, is rapidly produced, and has the same bad effect as if we were instantly to put a free liver upon a very low and abstemious diet.

In all cases of flooding, we find that during the paroxysm, the pulse flags, and the person becomes faint. Complete syncope may even take place, but this in many cases is more dependent on sickness or oppression at the stomach, than on direct loss of blood. In delicate and irritable habits, the number of fainting fits may be great, but unless the patient be much exhausted, we generally find that the pulse returns and the strength recruits. The prognosis here must depend greatly on the quantity and velocity of the discharge; for it may happen, that the first attack of hemorrhage may produce a syncope, from which the patient is never to recover.

OF THE TREATMENT OF UTERINE HEMORRHAGE.

WHEN we are called to a patient recently attacked with flooding, our most obvious duty is immediately to restrain the violence of the discharge; after which we can take such measures as the nature of the case may demand, either for preserving gestation, or for hastening the expulsion of the child.

A state of absolute rest, in a horizontal posture, is to be enforced with great perseverance, as the first rule of practice. By rest alone, without any other assistance, some hemorrhages may be cured; but, without it, no woman can be safe. Even after the immediate alarm of the attack is over, the woman must still recollect her danger. She should be confined to bed, upon a firm mattress, for several days, and ought not to leave her apartment for a much longer period.

In general, the patient has gone to bed before we are called; and, perhaps, by the time that we arrive, the bleeding has in a great measure ceased. The partial unloading of the vessels, produced by the rupture, the induction of a state approaching to syncope in consequence of the discharge, the fear of the patient, and a horizontal posture, may all have conspired to stop the hemorrhage.

The immediate alarm from the flooding having subsided, the patient often expresses herself as more apprehensive of a premature labour, than of the hemorrhage, which she considers as over. If the attack have been accompanied with slight abdominal pain, her fears are confirmed. But we are not to enter into these views of the case ; we are to consider the discharge as the prominent symptom, as the chief source of danger. We are to look upon the present abatement as an uncertain calm ; and whatever advice we may give, whatever remedies we may employ, we are not to leave our patient, until we have strongly enforced on her attendants the danger of neglect, and the necessity of giving early intimation, should the hemorrhage be renewed. There is no disease to which the practitioner can be called, in which he has greater responsibility than in uterine hemorrhage. The most prompt and decided means must be used ; the most patient attention must be bestowed ; and, whenever he undertakes the management of a case of this kind, whatever be the situation of the patient, he must watch her with constancy, and forget all consideration of gain and of trouble. His own reputation, his peace of mind, the life of his patient, and that of her child, are all at stake. I am doing the student the most essential service, when I earnestly press upon his attention these considerations. And when I intreat, implore him to weigh well the proper practice to be pursued, the necessary care to be bestowed, I am pleading for the existence of his patient, and for his own honour and happiness. Procrastination, irresolution, or timidity, have hurried innumerable victims to the grave ; whilst the rash precipitation of unfeeling men has only been less fatal, because negligence is more common than activity.

I shall endeavour to point out the proper treatment in the commencement of uterine hemorrhage, and the best method of terminating the case when the patient cannot be conducted with safety to the full time.

After the patient is laid in bed, it is next to be considered how the hemorrhage is to be directly restrained, and whether we may be able to prevent a return. It is at all times proper to ascertain exactly the situation of the patient by examination, as we then learn the state of the cervix and os uteri ; and whether there be any tendency to labour ; whether the discharge be stopped by a coagulum in the mouths of the vessels *, or by a large clot in the upper part of the vagina; whether the placenta be attached to os uteri, or whether the membranes present. We likewise endeavour to ascertain the quantity of blood which has been lost—the rapidity with which it flowed—the effect which it has produced upon the mother or child—and the cause which appeared to excite the hemorrhage.

The first remedy which, upon a general principle, offers itself to our attention, is blood-letting. In those cases, where the attack has been produced by over action of the vessels, or a plethoric condition; or where it seems to be kept up by those causes, this remedy employed early, and followed by other means, may be effectual not only in checking the present paroxysm, but also in preventing a return. By the timely and decided use of the lancet, much distress may be avoided, and both the mother and the child may be saved from danger. But we are not to apply the remedy for one state to every condition; we must have regard to the cause, and consider how far the hemorrhage is kept up by plenitude or morbid activity of the vessels. In those cases where the attack is not excited by, or connected with plethora, or undue action in the vascular system, venesection is not indicated. We have in these cases, which are, I believe, by far the most numerous, other means of safety, and powerfully moderating vascular action, without the detraction of blood, which in this disease ought to be a leading principle to save as much as possible. Whatever lessens materially or suddenly the quantity of blood, must directly enfeeble, and call for a new supply, otherwise the system suffers for a long time.

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* We may conjecture that this is the case, if we find no clot in the vagina, plugging the os uteri. We are not warranted to thrust the finger forcibly within the os uteri, in this examination; or to rub away the small coagula which may be formed within it, and which may be restraining the hemorrhage.

We shall find, that except under those particular circumstances which I have specified, and where we have ground to believe, that the rupture of vessels has been dependent on their plenitude or over action, the circulation may be speedily moderated, by other means, and especially by the application of cold. This is to be made not only by applying cloths dipped in cold water to the back and vulva, but also by sponging over the legs, arms, and even the trunk, with any cold fluid; covering the patient only very lightly with clothes, and promoting a free circulation of cold air, until the effect upon the vessels be produced. After this we shall find no advantage, but rather harm, from the further application of cold. All that is now necessary, is strictly and constantly to watch against the application of heat, that is, raising the temperature above the natural standard.

The extent to which this cooling plan is to be carried, must depend upon circumstances. In a first attack, it is in general to be used in all its vigour; but where the discharge, either towards the end of this attack, or in a subsequent paroxysm, has gone so far as to reduce the heat much below the natural standard, the vigorous application of cold might sink the system too much. In some urgent cases it may even be necessary to depart from our general rule, and apply warm cloths to the hands, feet, and stomach. This is the case where the discharge has been excessive, and been suffered to continue profuse or for a long time, and where we are afraid that the system is sinking fast, and the powers of life giving way. There are cases in which some nicety is required in determining this point, and in those circumstances we must never leave our patient, but must watch the effects of our practice. This is a general rule in all hemorrhages, whatever their cause may have been, or from whatever vessel the blood may come.

A cold skin and a feeble pulse never can require the positive and vigorous application of cold; but, on the other hand, they do not indicate the application of heat, unless they be increasing, and the strength declining. Then we cautiously use heat, to preserve what remains, not rashly and speedily to increase action beyond the present state of power.

When an artery is divided, it is now the practice to trust for a cure of the hemorrhage to compression, applied by a ligature. We cannot, however, apply pressure directly and mechanically to the uterine vessels, but we can promote coagulation, which has the same immediate effect. Rest and cold are favourable to this process, but ought only in slight cases to be trusted to alone. In this country it has been the practice to depend very much upon the application to the back or vulva, of cloths dipped in a cold fluid, generally water, or vinegar and water: but these are not always effectual, and sometimes, from the state of the patient, are not admissible.

Plugging the vagina with a soft handkerchief*, answers every purpose which can be expected from them; and whenever a discharge takes place to such a degree as to be called a flooding, or lasts beyond a very short time, this ought to be resorted to. The advantage is so great and speedy, that I am surprised that it ever should be neglected. I grant that some women may, from delicacy or other motives, be averse from it; but every consideration must yield to that of safety: and it should be impressed deeply on the mind of the patient as well as of the practitioner, that blood is most precious, and not a drop should be spilled which can be preserved.

Unless the flooding shall in the first attack be permanently checked, which, when the separated vessels are large or numerous, is rarely accomplished, we may expect one or more returns before expulsion can be accomplished. The more blood then that we allow to be lost at first, the less able will the patient be to support the course of the disease, and the more unfavourable will delivery, when it comes to be performed, prove to her and to the child. It is of consequence to shorten the paroxysm as much as possible, and therefore when circumstances will permit, we should make it a rule to have from the first a careful nurse, who may be instructed in our absence to use the napkin without delay, should the hemorrhage return.

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* The insertion of a small piece of ice in the first fold of the napkin, is attended with great advantage, and has often a very powerful effect. Dr. Hoffman employed the introduction of lint dipped in solution of vitriol; but this was rather as an astringent than a plug; but he does not propose it as a general practice. He considers that he was obliged to have recourse ad anceps & extremum auxilium, opera omnia, t. iv. Leroux employed the plug more freely.—Vide observations sur les portes, 1776.

But whilst I so highly commend, and so strongly urge the use of the plug, I do not wish to recommend it to the neglect of other means, or in every situation. In the early attacks of hemorrhage, when the os uteri is firm, and manual interference is improper, I know of no method more safe or more effectual for restraining the hemorrhage and preserving the patient. But when the hemorrhage has been profuse, or frequently repeated, and the circumstances of the patient demand more active practice, and point out the necessity of delivery, then the use of the plug cannot be proper, if trusted to : it may be attended with fatal and deceitful effects. We can indeed restrain the hemorrhage from appearing outwardly, but there have been instances, and these instances ought to be constantly remembered, where the blood has collected within the uterus, which having lost all power, has become relaxed, and been slowly enlarged with coagula; the strength has decreased—the bowels become inflated—the belly swelled beyond its size in the ninth month *, although the patient may not have been near that period; and in these circumstances, whilst an inattentive practitioner has perhaps concluded that all was well with regard to the hemorrhage, the patient has expired, or only lived long enough to permit the child to be extricated. All practical writers warn us against internal flooding, nay, so far do some carry their apprehension, that they advise us to

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* Vide Elements of Midwifery, by M. Baudelocque, tom. 2.

raise the head of the child, and observe whether blood or liquor amnii be discharged *; an advice, however, to which I cannot subscribe, because in those cases where the membranes have given way, or been opened, the head cannot be thus moveable, nor these trials made, unless we have waited until a dangerous relaxation has taken place in the uterine fibres; and if, on the other hand, we have delivery in contemplation, it is our object to confine the liquor amnii as much as possible, until we turn the child.

Such are the most effectual methods of speedily or immediately stopping the violence of the hemorrhage. The next points for consideration are, whether we can expect to carry the patient safely to the full time, and by what means we are to prevent a renewal of the discharge.

It may, I believe, be laid down as a general rule, that when a considerable portion of the decidua has in the seventh month, or later, been separated, the hemorrhage, although it may be checked, is apt to return. When a part of the placenta has been detached, and more especially if that organ be fixed over the os uteri, gestation cannot continue long, for either such injury is done to the uterus as produces expulsion and a natural cure, or the woman bleeds to death, or we must deliver in order to prevent that dreadful termination.

If the discharge be in small quantity, and have not flowed with much rapidity—if it stop soon or easily—if no large clots are formed in the vagina—if the under part of the uterus has its usual feel, showing that the placenta is not attached there, and that no large coagula are retained within the os uteri—if the child be still alive—if there be no indication of the accession of labour—and if the slight discharge which is still coming away, be chiefly watery, we may in these circumstances conclude that the vessels which have given way are not very large, and have some reason to

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* Vide Dr. Johnson's System of Midwifery, p. 157; and Dr. Leake's Diseases of Women, vol. 2. p. 280.

expect that by care and prudent conduct, the full period of gestation may be accomplished. It is difficult to say whether in this event the uterus forms new vessels to supply the place of those which have been torn, and whether reunion be effected by the incorporation of these with corresponding vessels from the chorion. In a case of abortion, we know that re-union takes place; but when in the advanced period of pregnancy, the decidua has become very thin, soft, and almost gelatinous, it is not established that the circulation may be renewed. At all events, we know that the power of recovery or reparation is very limited, and can only be excited when the injury is not extensive. The means for promoting re-union of the uterus and decidua, are the same with those which we employ for preventing a return of the hemorrhage, and there we advise, even when we have little hope of effecting re-union, and making the patient go to the full time, because it is our object to prevent as much as possible the loss of blood.

When the placenta is partly separated, all the facts of which we are in possession are against the opinion that reunion can take place. If the spot be very trifling, and the vessels not large, we may have no return of the bleeding; a small coagulum may permanently restrain it; but if the separation be greater, and the placenta attached low down, or over the os uteri, the patient cannot go to the full time, unless that be very near its completion. We judge of the case by the profusion and violence of the discharge, for all great hemorrhages proceed from the separation of the placenta, and by the feel of the lower part of the uterus, by the quantity of clots, and the obstinacy of the discharge, which may perhaps require even actual syncope to stop the paroxysm.

The best way in which we can prevent a return, is by moderating the circulation, and keeping down the actions of the system to a proper level with the power. The propriety of attending to this rule will appear, if we consider among other circumstances, that when a person has had an attack of flooding, a surprise, or any agitation which can give a temporary acceleration to the circulation, will often renew the discharge. The action of the arteries depends very much upon that of the heart, and the action of this organ again is dependent on the blood. When much blood is lost, the heart is feebly excited to contraction, and in some cases it beats with no more force than is barely sufficient to empty itself. This evidently lessens the risk of a renewal of the bleeding; and in several cases, as for example, in hemoptysis, we, by suddenly detracting a quantity of blood, speedily excite this state of the heart. Whatever tends to rouse the action of the heart, tends to renew hemorrhage; and if the proposition be established that the rapidity with which the strength and action of the vessels are diminished, is much influenced by the rapidity with which a stimulus is withdrawn, the converse is also true, and we should find, were it practicable, to restore the quantity of blood as quickly as it has been taken away, that the same effect would be produced on the action of the heart, as if a person had taken a liberal dose of wine.

It has been the practice to give nourishing diet to restore the quantity of blood; but until the ruptured vessels be closed, or the tendency to hemorrhage stopped, this must be hurtful. It is our anxious wish to prevent the loss of blood, but it does not thence follow that when it is lost we should wish rapidly to restore it. This is against every principle of sound pathology, but it is supported by the prejudices of those who do not reflect, or who are ignorant of the matter. When a person is reduced by flooding, even to a slight degree, taking much food into the stomach, gives considerable irritation; and, if much blood be made, vascular action must be increased. What is it which stops the flow of blood, or prevents for a time its repetition? Is it not diminished force of the circulation which cannot overcome the resistance given by the coagula? Does not motion displace these coagula, and renew the bleeding? Does not wine increase for a time the force of the circulation, and again excite hemorrhage? Is it not conformable to every just reasoning, and to the experience of ages, that full diet is dangerous when vessels are opened? Do we not prohibit nourishing food and much speaking in hemorrhage from the lungs, and can nourishing diet and motion be proper in hemorrhage from the uterus? If it were possible to restore in one hour the blood which has been lost in a paroxysm of flooding, it is evident that unless the local condition of the parts was altered, the flooding would, at the end of that hour, be renewed.

The diet should be light, mild, given in small quantity at a time, so as to produce little irritation *; and much fluid, which would soon fill the vessels, should be avoided. We shall do more good by avoiding every thing which can stimulate and raise action †, than by replenishing the system rapidly, and throwing rich nutriment into the stomach.

It is, however, by no means my intention to say that we must, during the whole remaining course of gestation, (provided that that go on, the attack having been permanently cured,) we should keep down the quantity of blood. I only mean

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[*] Such as animal jellies, sago, toasted bread, hard biscuit, &c. These articles given at proper intervals, are sufficient to support the system without raising the action too much.

[†] The system, with its power of acting, may, for illustration, be compared to a man with his income. He who had formerly two hundred pounds per annum, but has now only one, must, in order to avoid bankruptcy, spend only one half of what he did before; and if he do so, although he has been obliged to live lower, yet his accounts will be square at the end of the year. The same applies to the system. When its power is reduced, the degree of its action must also be reduced; and by carefully proportioning the one to the other, we may often conduct a patient through a very great and continued degree of feebleness. At the same time it must be observed, that as there is an income so small as not to be sufficient to procure the necessaries of life, so also may the vital energy be so much reduced, as to be inadequate to the performance of those actions which are essential to our existence, and death is the result. But surely he who should attempt to prevent this by stimulating the system, would only hasten the fatal termination: does not heat overpower and destroy those parts which have been frost bitten?

that we are not rapidly to increase it. Even where the strength has been much impaired by the profusion of the discharge, or the previous state of the system, it is rather by giving food so as to prevent farther sinking, than by cramming the patient, that we promote recovery; and I beg it to be remembered, that although I talk of the management of those who are much reduced, yet I am not to be understood as in any degree encouraging the practice of delivery, and allowing the patient to come into this situation of debility; but when we find her already in this state, it is not by pouring cordials and nutriment profusely into the stomach, that we are to save her; it is by preventing farther loss, and farther weakness; it is by giving mild food, so as gradually to restore the quantity of blood and the strength; it is by avoiding the stimulating plan on the one hand, and the starving system on the other, that we are to carry her safely through the danger.

Some medicines possess a great power over the blood-vessels, and enable us in hemorrhage to cure our patient with less expense of blood than we could otherwise do. The digitalis is of this class, and may often be given with much advantage in flooding, where the pulse indicates increased vascular action, and when we do not mean to proceed directly to delivery. But when the discharge has been trifling, and the pulse is slow, and perhaps feeble, the digitalis is unnecessary even from the first; and if, in the progress of the disease, the stomach have become affected, and the patient is sick, inclined to vomit, or faintish, or the pulse feeble and small, it is likewise improper.

In those cases which demand it, when the pulse is sharp, and throbbing, and frequent, it may be given either in the form of powder or of tincture; half a grain of the dried leaves may be given every two hours, until the pulse be affected, and afterwards at longer intervals, so as to keep the circulation moderate. The tincture may also be employed with the same advantage. Two drams may be added to a four-ounce mixture, and a table-spoonful given every two hours, watching the effect, and diminishing the dose when necessary. The addition of a little well-prepared hepatised ammonia sometimes makes the effect be more speedily produced, but not more than five drops should be added to each dose.

At the same time that we thus endeavour to diminish the action of the vascular system, we must also be careful to remove as far as we can every irritation. I have already said all that is necessary with regard to heat, motion, and diet. The intestinal canal must also be attended to, and accumulation within it should be carefully prevented by the regular exhibition of laxatives. A costive state is generally attended with a slow circulation in the veins belonging to the hepatic system, and of these the uterine sinuses form a part. If the arterial system be not proportionally checked, this sluggish motion is apt, by retarding the free transmission along the mesaraic veins, to excite the hemorrhage again.

Uneasiness about the bladder or rectum, or even in more distant parts, should be immediately checked, for in many cases hemorrhage is renewed by these irritations. In those cases, or where the patient is troubled with cough, or affected with palpitation, or an hysterical state, much advantage may be derived from the exhibition of opiates. In many instances where an attack of flooding is brought on by some irritation affecting the lower part of the uterus in particular, or the system in general, or where the bowels are pained, and the pulse not full nor strong, rest, cool air, and an adequate dose of tincture of opium will terminate the paroxysm, and perhaps prevent a return. This is especially the case, if only a part of the decidua have been separated, and the discharge have not been profuse. When the vascular system is full, venesection is necessary before the anodyne be administered, and the digitalis may either succeed the opiate, or be omitted, according to the state of the pulse and of the stomach.

But although anodynes be in many instances, and especially in first attacks, of great benefit; yet they are not to be indiscriminately employed nor exhibited when the circumstances of the patient require delivery. In this case, whatever tends to deaden the activity of the muscular fibre is improper, for it is to contraction alone that we look for preservation.

It may happen that we have not been called early in a first attack, and that some urgent symptom has appeared. The most frequent of these, is a feeling of faintness or complete syncope. This feeling often arises rather from an affection of the stomach than from absolute loss of blood; and in this case it is less alarming than when it follows copious hemorrhage. In either case, however, we must not be too hasty in exhibiting cordials. When the faintishness depends chiefly upon sickness at the stomach, or feeling of failure, as these may accompany even a small discharge, it will be sufficient to give a spoonful of ice cream, or a few drops of hartshorn in cold water, and sprinkle the face with cold water. When it is more dependent on absolute loss of blood, we may find it necessary to give small quantities of wine warmed with aromatics; but our cordials even in this case must not be given with a liberal hand, nor too frequently repeated *. It is scarcely necessary for me to add, that we are also to take immediate steps by the use of the plug, &c. for restraining the discharge. This I may observe once for all.

Complete syncope is extremely alarming to the by-standers; and, if there have been a great loss of blood, it is indeed a dangerous symptom. It must at all times be relieved, for although faintness be a natural mean of checking hemorrhage, yet absolute and prolonged syncope is hazard-

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* As syncope and loss of blood have both the effect of relaxing the muscular fibre, as is well known to surgeons, it may be supposed that they should increase the flooding by diminishing the contraction of the uterus, if that have already taken place. But the contrary is the case, for, by allowing coagula to form, syncope restrains hemorrhage, and therefore ought not to be too rapidly removed.

ous. But we are not to exhibit large doses of cordials for its removal. We must keep the patient at perfect rest, in a horizontal posture, with the head low: open the windows, sprinkle the face smartly with cold vinegar, apply volatile salts to the nostrils, and give some hartshorn, or a spoonful of warm wine internally.

Universal coldness is also a symptom which must not be allowed to go beyond a certain degree, and this degree must be greatly determined by the strength of the patient and the quantity and rapidity of the discharge. When the strength is not previously much reduced, a moderate degree of coldness is, if the hemorrhage threaten to continue, of service: but when there has been a great loss of blood, universal coldness, with pale lips, sunk eyes, and an approaching deliquium, may too often be considered as a forerunner of death. When we judge it necessary to interfere, we should apply warm cloths to the hands and feet, a bladder half filled with tepid water to the stomach, and give some hot wine and water internally.

Vomiting is another symptom which sometimes appears. It very generally proceeds from the attendants having given more nourishment of fluid than the stomach could bear, or from a gush of blood taking place soon after the patient has had a drink. It in this case is commonly preceded by sickness and oppression, which are most distressing, and threaten syncope until relief is obtained by vomiting. Sometimes it is rather connected with an hysterical state, or with uterine irritation. If frequently repeated, it is a debilitating operation, and by displacing clots may renew hemorrhage; but sometimes it seems fortunately to excite the contraction of the uterus, and gives it a disposition to empty itself. For abating vomiting, we may apply a cloth dipped in laudanum, and camphorated spirits of wine, to the whole epigastric region; or give half a grain or a grain of solid opium, followed by effervescing draughts. Sometimes a little infusion of capsicum is of service. It should just be gently pungent. In flooding it is of importance to pay much attention to the state of the stomach, and prevent it from being loaded; on the other hand, we must not let it remain too empty, nor allow its action to sink. Small quantities of pleasant nourishment should be given frequently. We thus prevent it from losing its tone, without oppressing it, or filling the system too fast.

Hysterical affections often accompany protracted floodings, such as globus, pain in the head, feeling of suffocation, palpitation *, retching, in which nothing but wind is got up, &c. These are best relieved by some fetid or carminative substance conjoined with opium. The retching sometimes requires an anodyne clyster, or the application of a camphorated plaster †, to the region of the stomach. Epileptic or convulsive fits may attend flooding in two ways, as an effect of profuse evacuation, or as a concomitant disease with the flooding, but not produced by it: that is to say, by loss of blood. It is necessary that we distinguish betwixt these two kinds of fits. We know that when an animal is bled to death, convulsion generally terminates the scene. In some cases, I have known even venesection produce convulsion; but in such patients there was generally some symptom which previously indicated an irritable state of the head. We also find that when people have been strangled, and are beginning to recover, that if a vein be opened, they sometimes become convulsed. The fits which succeed hemorrhage are of the same kind with all these; and it is not of much practical utility to fix their nature with nosological nicety. We distinguish them by the pale visage, dead eye, and feeble pulse of the patient: we learn that the hemorrhage

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* The quantity of blood lost is sometimes so great as to do irreparable injury to the heart, and ever after to impede its action. One well marked instance of this is related by Van Swieten, in his Commentary on Aph. 1304, where, for twelve years, the woman after a severe flooding, could not sit up in bed without violent palpitation and anxiety.

† This may be made by melting a little adhesive plaster, and then adding to it a large proportion of camphor previously made into a thick liniment by rubbing it with olive oil.

has been profuse; and perhaps it is not yet checked. The rule here I apprehend to be very plain. The face is to be sprinkled with cold water, a free circulation of cool air procured, and some spiritus ammoniac aromaticus given in cinnamon water. Sometimes the addition of laudanum is of benefit. But in these, as well as in other convulsions, it is chiefly to delivery that we look for effectual security; for whatever temporary abatement of the hemorrhage, or of the fit, we may have procured, it is to delivery that we trust for permanent safety.

But there are convulsions of a different kind, which do not arise from the hemorrhage, but rather accompany it. They may perhaps appear first, and the hemorrhage succeed them; or, owing to a fright or other causes, symptoms of premature labour, attended with flooding, may appear, and the convulsions may supervene many hours after the hemorrhage has stopped, and the indication of labour gone off. But it generally, though not uniformly, happens, that when the convulsions come on, the hemorrhage is renewed. Now, in these alarming cases, we have no time to lose, for the patient is exposed to a double danger. The practice must be prompt. If the convulsions have occurred early, and before much blood has been lost, we shall find that the eye is suffused, and the countenance red, the pulse firm, and often full. In those circumstances the fits may be long continued and severe. If we are to save our patient, it is by opening the jugular vein, or making a large incision in one of the veins of the arm. But when the fits have been later in coming on, or much blood has been lost there, although it be a general rule that the disease requires speedy evacuation, yet it rests with the judgment of the practitioner to determine whether this rule has not already been acted on sufficiently by the loss from the uterine vessels; for as we know that, in ordinary cases of puerperal convulsions, bleeding does not always terminate the paroxysm, so the continuance of the fit in this case does not of itself prove that the hemorrhage has not already done all that can properly be done by evacuation.

But it is not by depletion alone that we expect to save our patient. We must empty the uterus by delivery; and, in general, in cases of convulsion complicated with hemorrhage, this is very easily done. We are not forcibly and violently to open the os uteri, but we are to operate slowly and cautiously; and in all those cases there is a tendency to labour or dilation, which assists us.

Violent spasms in the stomach sometimes are a prelude to an epileptic fit; and, in this case, besides attending to the general treatment demanded on account of the convulsion, we must give laudanum and carminatives; but where the convulsion does not immediately come on, it may, if the pulse and condition of the patient permit, be sometimes prevented by bleeding *. Cases of single spasm unattended with a tendency to affection of the brain, requires the immediate exhibition of laudanum, and ether, in a full dose. These spasms are not unfrequently preceded by cramp of the muscles of the leg. Sometimes uterine hemorrhage is complicated with discharge of blood from the lungs, stomach, or other organs; and most of these cases prove fatal. Besides attending to the management of the flooding, the other hemorrhages must be treated pretty much on general principles; and the sooner that the delivery can be safely accomplished, the better it is for the patient.

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* And when this pain occurs in those who have either had no flooding or very little, I believe it ought to be a general rule to bleed, unless some very strong objection arise from the peculiar circumstances of the individual.

OF DELIVERY.

AFTER having made these observations on the management of flooding, and the best means of moderating its violence, of preventing a return, and of relieving those dangerous symptoms which sometimes attend it; I next proceed to speak of the method of delivering the patient when that is necessary. I have separated the detail of the medical treatment of a paroxysm from the consideration of the manual assistance, which may be required; because, however intimately connected the different parts of our plan may be in actual practice, it is useful in a work of this kind, in order to avoid confusion, that I lay them down apart.

As some peculiarities of practice arise from the implantation of the placenta, over the os uteri, I shall confine my present remarks to those cases in which the membranes are found at the mouth of the womb, desiring it to be remembered, however, that this circumstance does not necessarily indicate that the hemorrhage does not proceed from separation of the placenta, which may be fixed very near the cervix, although it cannot be felt.

The operation of delivering the child is not difficult to describe or to perform. The hand, previously lubricated, is to be slowly and gently introduced into the vagina. The finger is to be introduced into the os uteri, and cautiously moved so as to dilate it; or if it has already dilated a little more, two fingers may be inserted, and very slow and gentle attempts made at short intervals to distend it; and the practitioner will do well to remember that he will succeed best when he rather acts so as to stimulate the uterus, and make it dilate its mouth, than directly to distend it. On the part of the operator is demanded much tenderness, caution, firmness, and composure; on the part of the patient, is to be desired patience, and resolution. The operator is to keep in mind, that painful dilation is dangerous; it irritates and inflames the parts, and the woman should complain rather of the uterine pains which are excited, than of the fingers of the practitioner. More or less time will be required fully to dilate the os uteri, according to the state in which the uterus was when the operation was begun. If the os uteri is soft, and pliable, and has already by slight pains been in part distended, a quarter of an hour will often be sufficient for this purpose; but if it has scarcely been affected before by pains, and is pretty firm, though not unyielding, then an hour may be required. I speak in general terms, for no rule can be given applicable to every case. The os uteri being sufficiently dilated, the membranes are to be ruptured, the hand introduced, the child slowly turned and delivered, as in footling cases, endeavouring rather to have the child *expelled* by uterine contraction, than *brought away* by the hand. Hasty extraction is dangerous, for the uterus will not contract after it*. The child being removed, and the belly properly supported, and gently pressed on by an assistant, the hand should again be cautiously introduced into the womb, and the two nuckles placed on the surface of the placenta, so as to press it a little, and excite the uterus to separate it. The hand may also be gently moved in a little time, and the motion repeated at intervals, so as to excite the uterus to expel its contents; but upon no account are we to separate the placenta and extract it. This must be done by the uterus; for we have no other sign that the contraction will be sufficient to save the woman from future hemorrhage. The whole process, from first to last, must be slow and deliberate, and we are never to lose sight of our object, which is to excite the expulsive power of the uterus. It is not merely to empty the uterus—it is not merely to deliver the child, that we introduce our hand: all this we may do, and leave the woman worse than if we had done nothing. The fibres must contract and press upon the vessels; and as nothing else can save the patient, it is essential that the practitioner has clear ideas of his object, and be convinced on what the security of the patient depends.

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* And, therefore, if when we are turning, we do not feel the uterus acting, we must move the hand a little, and not begin to deliver until we perceive that the womb is contracting. The delivery must be slow, until the breach is passing, then we must be careful that the cord be not too long compressed before the rest of the child be born.

But to teach the method of delivery, and say nothing of the circumstances under which it is to be performed, would be a most dangerous error. I have, in the beginning of this work, pointed out the effect of hemorrhage, both on the constitution, and on the uterus: and I have stated that the action of gestation is always impaired by a certain loss of blood, and a tendency to expulsion brought on. But before the uterine contraction can be fully excited, or become effective, the woman may perish, or the uterus be so enfeebled as to render expulsion impossible. Whilst then we look upon the one hand to the induction of contraction, we must not on the other delay too long. We must not witness many and repeated attacks of hemorrhage; sinking the strength, bleaching the lips and tongue, producing repeated fainting fits, and bringing life itself into immediate danger.

Such delay is most inexcusable and dangerous; it may end in the sudden loss of mother and child; it may enfeeble the uterus, and render it unable afterwards to contract; or it may so ruin the constitution, as to bring the patient, after a long train of sufferings, to the grave.

Are we then uniformly to deliver upon the first attack of flooding, and forcibly open the os uteri? By no means; safety is not to be found either in rashness, or procrastination.

The treatment which I have pointed out, will always secure the patient, until the delivery can be safely accomplished. As long as the os uteri is firm and unyielding—as long as there is no tendency to open, no attempt to establish contraction *, it is perfectly safe to trust to the plug, rest, and cold. Did I not know the danger of establishing positive rules, I would say, that as long as the os uteri is firm, and has no disposition to open, the patient can be in little risk if we understood the use of the plug; we may even plug the os uteri itself, which will excite contraction. But if the patient be neglected; then I grant that long before a tendency to labour or contraction be induced, she may perish. I am not, however, considering what may happen in the hands of a negligent practitioner; for, of this, there would be no end, but what ought to be the result of diligence and care.

It is evident that when the uterus has a disposition to contract, and the os uteri to open, delivery must be much safer and easier, than when it is still inert, and the os uteri hard.

We may with confidence trust to the plug, until these desirable effects be produced; and in some instances we shall find that by the plug alone we may secure the patient: the contraction may become strong if we have prevented much loss of blood, and expulsion may naturally take place. Who would in those circumstances propose to turn the child and deliver it? Who would not prefer the operation of nature to that of the accoucheur? To determine in any individual case whether this shall take place, or whether delivery must be resorted to, will require deliberation on the part of the practitioner. If he have used the plug early and effectually, and the pains have become strong, he has good reason to expect natural expulsion, and the labour must be conducted on the general principles of midwifery. But if the uterus have been enfeebled by loss of blood—if the pains are indefinite

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* In considering the effects produced by uterine hemorrhage, I have stated that its tendency is to injure gestation, and excite contraction of the uterine fibres. Pains come thus, frequently, to attend hemorrhage; but the uterus may, by loss of blood, be so enfeebled, that no benefit can be derived from them, either in checking the discharge, or expelling the child.

—if they have done little more than just to open the os uteri, and have no disposition to increase, then he is not justified in expecting that expulsion shall be naturally and safely accomplished, and he ought to deliver.

Thus it appears, that by the early and effective use of the plug, by filling the vagina with a soft napkin, or with tow, we may safely and readily restrain hemorrhage, until such changes have taken place on the os uteri, as to render delivery easy; and then we either interfere or trust to natural expulsion, according to the strength and force of the contraction and state of the patient.

By this treatment we obtain all the advantage that can be derived from the operations of nature; and where these fail, are enabled to look with confidence to the aid of artificial delivery.

But it may happen that we have not had an opportunity of restraining the hemorrhage early; we may not have seen the patient until she has suffered much from the bleeding *. In this case, we shall generally be obliged to deliver, and must upon no account delay too long; yet, if the os uteri be firm, and without disposition to open, we shall generally find that the sinking is temporary: we may still trust for some time to the plug.

Hemorrhage is naturally restrained by syncope, or a state approaching to it, and this checks the paroxysm. A repetition is checked in the same way, and syncope takes place sooner than formerly. In one or two attacks, the uterus suffers, and the os uteri becomes dilatable. Slight pains appear, or are readily excited by attempts to distend the os uteri. Syncope then will, in general, even when the plug has not been moved, and the patient has been neglected, restrain hemorrhage, and prevent it from proving fatal, until the os uteri has relaxed; but a little delay beyond that pe-

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* We are not to confine our attention to the quantity which has been lost, but to the effect it has produced; and this will, ceteris paribus, be great in proportion as the hemorrhage has been sudden.

riod will destroy the patient; and it is possible, by giving wine, and otherwise treating her injudiciously, to make hemorrhage prove fatal, even before this takes place. But although I have considered it as a general rule, that where the os uteri is firm, and unyielding, we may, notwithstanding present alarm, trust some time to the plug, yet I beg it to be remembered, that there may be exceptions to this rule; for the constitution may be so delicate, and the hemorrhage so sudden, or so much increased by stimulants, as to induce a permanent effect, and make it highly desirable that delivery should be accomplished: but such instances are rare.

These are encouraging facts; and I believe the experience of every practitioner will establish that even when the patient has not had the positive advantage of judicious management, if only direct mischief, such as giving stimulants, has been avoided, we may in every instance find a time in which delivery will be easily practicable. If we be called before this, we may, by plugging and other attentions, keep the patient safe until either effective contraction, or a state readily permitting of delivery, takes place. If we be called late, then we have, by the result, too often to deplore the mischief of delay.

The old practitioners, not aware of the value of the plug, nor acquainted with the sound principle of physiology, had no fixed rule relating to delivery, but endeavoured to empty the uterus early*; but it was uniformly a remark, that those women died who had the os uteri firm and hard †. What is this but to declare that the rash and premature operation is fatal? It is an axiom which should be deeply engraven on the memory of the accoucheur, and which should constantly influence his conduct. Pain and suffering are the immediate consequence of the practice, whilst a repetition of the flooding after delivery, or the accession of inflammation, are the messengers of death.

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[*] Vide Oulde's Treatise on Midwifery, p. 75.

[†] Vide the works of Mauriceau Peu, &c.

It was the fatal consequence of this blind practice that suggested to M. Puzos the propriety of puncturing the membrane, and thus endeavouring to excite labour. His reasoning was ingenious—his proposal was a material improvement on the practice which then prevailed. The ease of the operation, and its occasional success, recommend it to our notice; but experience has now determined that it cannot be relied on, and that it may be dispensed with. If we use it early, and on the first attack, we do not know when the contraction may be established; for even in a healthy uterus, when we use it on account of a deformed pelvis, it is sometimes several days before labour be produced. We cannot say what may take place in the interval. The uterus being slacker, the hemorrhage is more apt to return, and we may be obliged, after all, to have recourse to other means, particularly to the plug. Now we know that the plug will, without any other operation, safely restrain hemorrhage, until the os uteri be in a proper state for delivery *. The proposal of M. Puzos then is, I apprehend, inadmissible before this time. If after this there be occasion to interfere, it is evident that we must desire some interference which can be depended on, both with respect to time and degree. This method can be relied on in neither; for we know not how long it may be in exciting contraction, nor whether it may be able to excite effective contraction after any lapse of time. If it fail, we render delivery more painful, and consequently more dangerous to the mother, and bring the child into hazard. It has been observed in

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* The ingenious M. Alphonse Le Roy seems much inclined to trust almost entirely to the plug, and supposes that the blood will act as a foreign body, and excite contraction; but this as a general doctrine must be greatly qualified. Respecting the proposal of M. Puzos, he observes, " Puzos, en conseillant assez hardiment de percer les eaux, n'avoit d'autres vues que la contraction de la matrice, qui est la suite de cette operation & la cessation de la perte, & il la conseilla même dans les cas des pertes qui arrivent avant terme. Mais un grand nombre de femmes sont peries par l'effet de cette même pratique. Leçons sur les pertes de sang, p. 45.

objection to this by the ingenious Dr. Denman *, that if turning be difficult, the flooding will be stopped by the contraction of the womb. But we know that the uterus, emptied of its water, may embrace the child so closely as to render turning, if not difficult, at least painful, and yet not be acting so briskly as to restrain flooding; nothing but brisk contraction can save a patient in flooding, if the vessels be large or numerous.

The only case then which remains to be considered, is that in which pains come on, and expulsion is going forward. Now, in this case, the flooding is stopped either by the contraction, or by the plug, and the membranes burst in the natural course of the labour: after which it is speedily concluded. Here, then, interference is not required; but if, after going on in a brisk way for some time, the pains abate a little, which often happens even in a natural labour, it will be proper to rupture the membrane, if we have reason to think that a slight stimulus to the uterus would renew its action; and in determining this, the practitioner must be influenced by the previous discharge, for if the uterus have been much reduced by it in its vigour, it will be less under the influence of a stimulus; and if, upon the present diminution of the pains, the flooding is disposed to return, I should think that we surely ought to trust rather to the hand, which can stimulate in the necessary degree, and point the process with safety, than to a method which is much more uncertain, and less under our command †.

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* Introduction to the Practice of Midwifery, vol. ii. p. 310.

† In those cases where the placenta presents, few practitioners would think of trusting to the evacuation of the liquor amnii; they would deliver. If then delivery be considered as safe and proper in one species of flooding, it cannot be dangerous in the other; and whenever interference in the way of operation is necessary, the security afforded by the introduction of the hand, will much more than compensate for any additional pain. But even in this respect, the two operations are little different, if properly performed.

The proposal of M. Puzos then will, if this reasoning be just, be very limited in its utility. Its simplicity gave me at first a strong partiality in its favour, and if I now have changed my opinion, I have given my reasons. It is a point of much practical consequence; and therefore I have not ventured to trust entirely to my own observation, but have endeavoured to obtain the opinion of those who were better able to judge, and for whose abilities I have much respect.

But there still remains a most important question to be answered. In those cases where the patient has been allowed to lose a great deal of blood frequently and suddenly, when the strength is gone, the pulse scarcely to be felt, the extremities cold, the lips and tongue without blood, and the eye ghastly; shall we venture to deliver the woman? Shall we, by plugging, endeavour to prevent farther loss, and by nourishment and care recruit the strength; or empty the uterus, and then endeavour to restore the loss? We have only a choice of two dangers. The situation of the patient is most perilous, and I have in practice weighed the argument with that attention which the awful circumstances of the case required. I think myself justified in saying, that we give both the mother and child the best chance of surviving by a cautious delivery. For in these cases the uterus is almost torpid; it possesses no tonic contraction*; the very continuance of the ovum within it is more than it can bear, and on the most favourable supposition, it will require many days before it could be brought into a state capable of contracting. The general system is completely exhausted, and cannot support its condition long. I have never known a woman live twenty-four hours in these circumstances.

On the other hand, I grant that it is possible the woman may die in the act of delivery, or very soon after it; but if she can be supported for two days, we may have hopes of recovery. By a very slow and cautious delivery, and by endeavouring to excite the action of the uterus, so as to prevent discharge afterwards, we not only remove the irritation of the distended womb, but we likewise take away a receptacle of blood. During the contraction of the uterus, the blood in its sinuses will be thrown into the system, and tend to support it. Part, no doubt, will escape; but by keeping the hand in the uterus, by supporting the abdomen with a compress, and exciting the uterine action by cold application to the belly, we may prevent a great loss. When to these considerations we add the additional chance which the child has for life, our practice, I apprehend, will, in this very hazardous case, be decided. When the pulse becomes firmer and fuller upon the contraction of the uterus, the risk from debility is diminished.

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* The use of the plug cannot here certainly prevent farther loss of blood, for the uterus affords no resistance, the hemorrhage continues, and after death large coagula will be found within the womb.

The remarks upon the subsequent management of the patient, I shall reserve until I come to consider the treatment of flooding, after delivery; as the same rules will nearly apply to both cases, I may merely observe that the two chief dangers which we have to dread, are weakness and inflammation. This last accident, it may be thought, should seldom follow profuse flooding: but the hemorrhage sometimes is so great as although it do not immediately sink the patient, is yet sufficient permanently to disorder the action of the uterus, and render it liable to inflammation. This tendency is powerfully increased by the improper use of cordials and spirits; and in most of the cases I have met with, there has been too much reason to fear that the accession of inflammation was owing to the imprudence of the patient in this respect. The danger arising from debility, is generally over in forty-eight hours; that arising from inflammation generally takes place about the end of that period; and when the uterus has been much enfeebled by the loss of blood, and the os uteri flabby and relaxed, we must be greatly on our guard against this disease.

OF THE PRESENTATION OF THE PLACENTA.

AT one time it was supposed that the placenta was in every instance attached originally to the fundus uteri, and that it could only be found presenting in consequence of having been loosened and falling down. This accident was supposed to retard the birth of the child, by stopping up the passage, and also was considered as dangerous on account of the flooding which attended it. On this account Daventer * endeavoured to accelerate the delivery by tearing the placenta, or rupturing the membranes when they could be found. This was a dangerous practice, and very few survived when it was employed. Mr. Gifford and M. Levret † were among the first who established it as a rule that the placenta did not fall down, but was from the first implanted over the os uteri: and the latter gentleman published a very concise and accurate view of the treatment to be pursued.

We know that during the eighth month of gestation, very considerable changes take place about the cervix uteri. It is completely developed and expended; and in the ninth month, very little distance intervenes betwixt the ovum and the lips of the os uteri. These changes cannot easily take place without a rupture of some of the connecting vessels,

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* Art of Midwifery, chap. xxxi.

† Te m'engage à prouver 1° que le placenta s'implante quelquefois sur la circonference de l'orifice de la matrice; c'est-à-dire, sur celui qui du col va joindre l'interieur de ce viscère, & non sur celui qui regarde de le vagin.

2do. Qu'en ce cas la perte de sang est *inevitable* dans les dernier tems de la grossesse.

Et 3o. Qu'il n'y a pas de voye plus sure pour remedier à cet accident urgent que de faire l'accouchement forcé.—L'art des Accouchemens, p. 343.

for either the placenta, does not adapt itself to the changes in the slope of the cervix: or, which happens more frequently, some slight mechanical cause, or action of the fibres about the os uteri, produces a rupture.

This rupture may, doubtless, take place at any period of pregnancy *, but it is much more frequent in the end of the eighth and beginning of the ninth month, than at any other time. But whether the separation happens in the seventh, eighth, or ninth month, the consequent hemorrhage is always profuse, and the effects most alarming. The quantity, but especially the rapidity of the discharge, very speedily produces a tendency to faint, or even complete syncope; during which the hemorrhage ceases, and the woman may continue for several days without experiencing a renewal of it. In some instances she is able to sustain many and repeated attacks, which may take place daily for some weeks. These, however, it is evident, cannot be very severe, and the strength must originally have been great. In other instances, the woman never gets the better of the first attack. It indeed diminishes, but does not altogether leave her, and a slight exertion renews it in its former violence. But whether the patient suffer much or little in the first attack—whether she be feeble or robust, the practice must be prompt, and the most solemn call is made upon the practitioner for activity. The moment that a discharge of blood takes place, he ought to ascertain by careful examination, the precise nature of the case, and must take instant steps for checking it, if nature have not already accomplished that event.

If the os uteri be firm and close in a first attack, we ought to use the plug, which will restrain the hemorrhage, and insure the present safety of the patient. If this practice

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* In some cases, hemorrhage has taken place so early as the third month. By proper means this has been stopped, and the patient has continued well for some months, when the flooding has returned, and the placenta been discovered to present.

have been immediately followed, she will in general soon recover, and the length of time for which she will remain free from a second attack, will depend very much upon the care which is taken of her; but sooner or later the attack must and will return. If the uterus have been injured in its action by the first attack, this will generally be attended with slight pains, and we shall feel the os uteri more open and laxer than usual; but if the first and second discharges have been promptly checked, it may be later before those effects be perceived: but the moment that they are produced, we ought to deliver, and it should even be a rule, that where they are not likely soon to take place, and the discharge has been profuse and rapid, and produced those effects on the system which I have already pointed out, as the consequence of dangerous hemorrhage, we must not delay until pains begin to open the os uteri. Fortunately, we are not often obliged to interfere thus early, for by careful management, and the use of the plug, we can secure our patient.

But very frequently we are not called, until the patient has had one or two attacks, and been reduced to great danger. We find her with feeble pulse, ghastly countenance, frequently vomiting, and occasionally complaining of slight grinding pains.

On examination, the vagina is so filled with clotted blood, which adheres so firmly by the lymph to the uterus, that at first we find some difficulty in discovering its mouth. We cannot here hesitate a moment, what course to follow. If the patient is to be saved, it is by delivery.

The os uteri will be in part dilated; it will easily be fully opened. We, perhaps, find an edge of the placenta projecting into the vagina, perhaps the centre of the placenta presenting or protruding like a cup into the vagina; but in all those cases the rule is the same. We pass by the placenta to the membranes, rupture them *, and turn the child, deli-

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* This is much safer for the child, than pushing the hand through

vering according to the directions which I have already given.

It may be supposed, that as the treatment is so nearly the same, it is not material that we distinguish whether the placenta or membranes present. But it is convenient to make a distinction, because in those cases where the placenta does not present, it is possible in certain circumstances to cure the flooding, and carry the patient to the full time; and in those cases, which are indeed the most numerous, where this cannot be done, we always look to uterine contraction as a very great assistance, and expect that where that is greatest, the danger will be least. But when the placenta presents, we have no hope of conducting the woman safely to the full time. We have no ground to look to contraction, or labour-pains, as a mean of safety; for, on the contrary, every effort to dilate the os uteri separates still more the placenta, and increases the hemorrhage *. The very circumstance which in some other cases would save the patient, will here in general increase the danger. I say in general, for those are doubtless examples where the patient has by labour been safely and without assistance delivered of the child, when part of the placenta has presented. Nay, there have been instances where the placenta has been expelled first, and the child after it †. These examples are to be met with in collections of cases by practical writers; and some solitary instances are likewise to be found in different journals. It would be much to be lamented if those should ever appear

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the placenta; and it is equally advantageous for the mother, and easy to the operator.

* The greatest number of profuse, or alarming hemorrhages, proceed from the presentation of the placenta, or the implantation of its margin over the os uteri; and, consequently the greatest number of cases requiring delivery are of this kind.

† Even in those cases where the placenta is expelled first, the flooding may recur, and the woman die, if she be not assisted. Vide La Motte. Obs. ccxxxviii, & ccxxxix.

without having at the same time a most solemn warning sent along with them to the accoucheur, to pay no attention to them in his practice *. I am convinced that they would do inexpressible mischief by affording argument for delay, and excusing the practitioner to himself for procrastination. There is scarcely any malady so very dreadful as not to afford some examples of a cure effected by the powers of nature alone; but ought we thence to tamper with the safety of those whose lives are committed to our charge? Ought we to neglect the early and vigorous use of an approved remedy, because the patient has not in every instance perished from the negligence of the attendant? It is highly proper to publish the case of a patient, who, from hernia, has had an anus formed at his groin, because it adds to our stock of knowledge. But what should we think of the surgeon who should put such a case into the hands of a young man, without, at the same time, saying, "Sir, if such a case ever happens in your practice, either you or your patient will be very much to blame?" I do not mean from this to say, that we are to blame in every instance the accoucheur who has attended a case where the placenta has presented, and the patient been delivered by nature; far from it, for by the use of the plug, he may have restrained the hemorrhage, pains may have come on, and the child descending, may have carried the plug before it; or, when he was called to his patient, he may have found her already in labour, and the process going on so well and so safely, that all interference would have been injudicious. But these instances are not to be converted into general rules, nor allowed to furnish any pretext for procrastination. They happen very seldom, and never ought to be related to a young man, without an express intimation that he is not to wave delivery when it is really required, upon any pretence whatsoever. I cannot do better than conclude these remarks with the opinion of a

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* Most of those who have met with such cases, do not seem to count much upon them.

gentleman of great judgment and experience. "It is a practice established by high and multiplied authority, and sanctioned by success, to deliver women by art in all cases of dangerous hemorrhage, without confiding in the resources of the constitution *."

OF HEMORRHAGE DURING LABOUR.

HITHERTO I have been considering those hemorrhages which occur in the three last months of gestation; and those which take place at an earlier period, I have treated of in a different work †. But it sometimes happens that hemorrhage does not appear until the patient be in labour at the full time. It may take place either in the commencement of labour, or when the os uteri is fully opened, or after the head or presenting part of the child has begun to enter the pelvis.

The causes which give rise to hemorrhage during labour, are nearly the same with those which produce it during gestation.

When it appears in the commencement of labour, it is seldom profuse, unless a small portion of the placenta stretch down towards the os uteri, and in this case the discharge may be very considerable, and produce all the effects which I have formerly described. We cannot always feel the placenta, but in every alarming or profuse hemorrhage, we may be pretty certain that a portion of it has been separated. Now, in this case, the safest practice is to stuff the vagina for some time, until the pains have opened to a considerable degree the os uteri, and then we can either turn or trust

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* Vide Dr. Denman's Introduction, Vol. ii. p. 298.

† Vide Observations on Abortion.

to the natural contraction of the uterus, according to the effect produced by the hemorrhage on the system, or by the pains upon the hemorrhage; but if the attack have been violent, and the os uteri already relaxed and dilatable, then we may save considerable loss of blood, and much danger, by immediately proceeding to delivery; and in all cases, it is to be a rule of practice, not to postpone delivery, when the patient has suffered considerably from the discharge, whether the os uteri be only a little open, or be fully dilated.

There is another case of hemorrhage, where the quantity of the discharge is considerable, but the effect trifling. This is merely the usual show, which attends labour, in greater quantity than common, mixed either with a dribbling of the liquor amnii, or a watery discharge from about the os uteri. It proceeds from the vessels of the decidua, being of an unusual size, or from a greater portion than usual of the membrane being separated. Some women are more subject to this than others; but it does not materially influence the labour, or call for any peculiarity of practice.

Hemorrhage may also proceed from the rupture of the umbilical cord, or of some vessel on the fœtal surface of the placenta; but in those cases it is evident that the membrane must have given way before the discharge appears. This is more dangerous to the child, than to the mother. It is difficult to ascertain that flooding proceeds from this cause, because we cannot easily determine that the discharge comes from within the amnion. If it can be established, delivery would certainly be proper to prevent the child from suffering.

Hemorrhage may appear in the more advanced stage of labour, and may proceed from a portion of the placenta having been detached by some partial action of the uterine fibres, or by the pressure of a projecting part of the child. Or by the general contraction of the uterus, some large vessel going to the decidua, or the placenta when it is situated low down, may be ruptured; and the uterus, from fatigue, may come to act feebly, and thus remove that pressure which restrained the hemorrhage *. This is especially apt to take place in preternatural presentations, where the action of the uterus has been long but ineffectually exercised; and in some instances, convulsions precede or accompany the hemorrhage. But whatever may have been the cause, the practice cannot be disputed. The child must be delivered either by turning, or by the forceps, according to the circumstances of the labour. We can seldom expect that the labour will be naturally accomplished; for the hemorrhage enfeebles the uterus; and, on the other hand, we find that very fatal consequences may follow from delay. Dr. Osborne judiciously observes, "If we wait until symptoms of danger arrive, the event will prove that, in general, we shall have already waited too long †."

OF HEMORRHAGE AFTER DELIVERY.

IN natural labour, after the expulsion of the child, the uterus contracts so much as to loosen the attachment of the placenta and membranes to its surface, and afterwards to expel them. This process is always accompanied by the discharge of blood, but the quantity in general is small. If, however, the uterine fibres should not duly contract after the delivery of the child, so as to diminish the diameter of the vessels, and at the same time accommodate the size of the womb to the substance which still remains within it; then, provided the placenta and membranes be wholly or in

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* I do not here notice the hemorrhage which proceeds from rupture of the uterus, because in that case it is complicated with another alarming accident, which would require a more extensive consideration, than can here be bestowed on it.

† Vide Essays, &c. p. 49.

part separated, the vessels which passed from the uterus to the ovum, will be open and unsupported, and will pour out blood with an impetuosity proportioned to their size and the force of the circulation. This flow will continue until syncope checks the motion, or coagula stop the mouths of the vessels.

It is evident that the cause of flooding is the torpor of the uterus *. The fibres may become inactive, or have their tonic contraction impaired immediately after the pain which expels the child. This will more especially happen if the woman be weakly, if the labour have been tedious, and the child at last have been expelled suddenly by a strong, but perhaps only momentary contraction.

The hemorrhage, therefore, appears very soon after delivery, and before the placenta has come away. It is profuse, and produces the usual effects of hemorrhage on the system, and those effects are greater and more speedy than those which follow from hemorrhage before delivery, for the loss is instant and extensive. The first gush indeed does not produce great debility, because it consists chiefly of blood which formerly circulated in the uterus, and is not taken directly from the general system; and the separation of the placenta not being wholly affected at once, the loss at first is more slow. But immediately after this, the effect appears in all its danger; and it is not unusual for the woman, if not assisted, to die within ten minutes after the birth of the child †.

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* When the uterus contracts strongly after the delivery of the child, it will be felt, if the hand be applied on the abdomen, like a hard and strong mass: but when torpid, it is not so distinctly felt, for it is softer, being destitute of tonic contraction.

† The patient may die speedily after the birth of the child, in consequence of other causes, some of which it may not be improper to notice. Sudden death may proceed from an organic affection of the heart, such as ossification of the valves or arteries, dilation of the cavities of the heart, or aneurism of the aorta. The effect of any sudden change in

This torpor of the uterus is sometimes so great and universal, that when the hand is introduced, it passes almost up to the stomach. At other times, a circular band of fibres contracts spasmodically about the middle of the uterus, inclosing the placenta about it, whilst the rest of the fibres be-

the system, in these cases, must be known to every practitioner. Whenever we suspect such disease, the most perfect rest must be observed after delivery. Should there be any inequality in the size of the two ventricles, the right being larger, for instance, than the left, then any cause capable of hurrying the circulation, may make both sides contract to their utmost; the consequence of which is, that all the blood in the right side is thrown out, but it cannot be received into the left: rupture of the pulmonary vessels must take place, and I have known many instances where the patient was immediately suffocated.

Violent spasms about the stomach or diaphragm, are also apt to produce sudden death. If, therefore, the patient have, during parturition, had any symptom indicating an approach of the spasm, she should have a full dose of tincture of opium immediately after delivery. In many cases, no doubt, we would have no attack, although this remedy should be omitted; but if we can so easily and safely prevent the probable occurrence of so much suffering and danger, we ought not to hesitate to use the means. This state of the stomach may also arise from sympathy with other organs besides the uterus. I have known slight pain produced by retaining the urine too long; and whenever the bladder was emptied, spasm attacked the stomach.

The brain may likewise have its action suddenly destroyed; and the patient, after complaining for a few seconds of pain in the head, dazzling of the eyes, or blindness, expires. At other times, regular epileptic fits take place, or we have violent shaking of the muscles, the person still remaining sensible. These affections are sometimes preceded by pain in the stomach or intestines, or cramp of the leg. A vein ought to be immediately opened, and the placenta cautiously extricated: if it have not been expelled, opiates should also be employed, if we have spasm about the stomach or bowels. When the spasm exists without convulsions, or when the pulse is feeble and small, bleeding is not indicated, but anodynes alone are more useful. Relief is sometimes obtained by removing coagula, which are irritating the uterus. Syncope sometimes succeeds tedious labour, or even natural labour, if the patient be delicate, and the abdomen left unsupported. The usual treatment must be employed. We must carefully observe that it do not proceed from internal flooding. In either case, if neglected, or the woman be moved much, it may prove fatal.

come relaxed. This has not inaptly been called the hour-glass uterus.

From this view, it is evident that flooding is to be prevented by preserving the action of the uterus, and avoiding whatever can increase the force of the circulation. A powerful means of keeping up the action of the womb, consists in preventing it from emptying itself too suddenly. It invariably happens, that when the child is instantaneously expelled by a single contraction, being in a manner projected from the uterus, or when the body is speedily pulled out, whenever the head is born, hemorrhage takes place; and, in a majority of instances, the uterus contracts on the placenta like an hour-glass. Delivery then is not to be hurried, the steps of expulsion should be gradual; instead of pulling out the body of the child, we should rather retard the expulsion when it is likely to take place rapidly. Those who estimate the dexterity and skill of an accoucheur by the velocity with which he delivers the infant, ground their good opinion upon a most dangerous and reprehensible conduct; and he who adopts this practice, must meet with many untoward accidents, and produce many calamities.

Another means of exciting the uterine action, is by supporting the abdomen, and making gentle pressure on it with the hand immediately after delivery. I do not say that this practice is in every instance necessary; but it is so generally useful, that it never ought to be omitted. The circulation is also to be moderated by the free admission of cool air, by lessening the quantity of bed-clothes, by a state of perfect rest, and by avoiding the exhibition of stimulants. If these directions, which are few and simple, be attended to, we shall seldom meet with hemorrhage after the delivery of the child. Some women, no doubt, are peculiarly subject to this accident. They are generally of a lax fibre, easily fatigued and fluttered, and subject to hysterical affections. When a woman is known to be subject to hemorrhage, we should redouble our care; and on the first appearance of discharge, perhaps in some instances immediately after the birth of the infant, we ought to introduce the hand into the uterus, which excites its action, and prevents flooding. We are not to meddle with the placenta, or endeavour to extract it; our object is to support the contraction of the womb, and make it in due time expel the secundines. This gives little pain, and may be attended with most important consequences to the future health or comfort of our patient.

Whenever a woman is seized with hemorrhage after delivery, that instant we ought to take steps for exciting the contraction of the uterus, upon which alone we place our hopes of safety *. Two very powerful means are at all times within our reach. The application of cold, and the introduction of the hand into the cavity of the uterus.

The retention of the placenta is not in general the cause of the hemorrhage, but a joint effect, together with it, of the torpor of the uterus. Our primary object then, is not to extract the placenta, but to excite the uterus to brisker action. How improper and dangerous then must it be to thrust the hand into the uterus, grasp the placenta, and bring it instantly away; or to endeavour to deliver the pla-

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* It is not my intention to advise immediate interference, although the discharge be a little more than usual; but whenever it is considerable, or is affecting the pulse, or producing other perceptible effects on the system, we ought not to delay. It is a fatal error to wait until dangerous symptoms appear; many weeks of suffering, perhaps death itself, may be the consequence. I cannot therefore agree with the ingenious M. Le Roy, in the following directions respecting hemorrhage after the birth of the child. "Quand la femme n'est pas delivrée & qu'il survient une perte, il faut attendre patiemment s'il ne se manifeste aucun symptôme alarmant, parce que cette perte cesse quelquefois d'elle-meme. Mais quand les symptômes sont alarmans & qu'on craint pour la vie de la femme, lorsque la matrice s'engorge & se dégorge alternativement, lorsq'enfin la femme se plaint d'eblouissemens dans les yeux; qu'ils deviennent convulsifs; que le pouls devient trop petit; que les extrémités sont froides; le visage d'une paleur mortelle; que le sang traverse le lit; qu'on entend dans le ventre des grouillemens qui annoncent la resolution des forces vitales; *alors* il faut employer des moyens proper à redonner du ressort à la matrice." Leçons, p. 50.

centa by pulling forcibly at the umbilical cord! By the first practice, we are apt to injure the uterus, and certainly cannot rely upon it for checking the hemorrhage. By the second, we either tear the cord or invert the uterus.

When we introduce the hand, we conduct it to the placenta, using the cord only as a director. We do not attempt to bring it away, but press upon it with the back of the hand, to excite the uterus to separate it; or, if it be already detached, and lying loose in the cavity of the womb, we move the hand gently to stimulate the uterus, but neither withdraw it, nor extract the placenta, until we feel the womb contracting.

The contraction of the uterus will be powerfully assisted by the application of cold. The quantity of clothes should be lessened; but our principal object is to apply cold as a topical remedy. Cloths dipped in cold water should be laid upon the belly, or cold water may be thrown suddenly upon it. In obstinate cases it has been found useful to project it forcibly with a syringe, or to throw it up into the uterus itself. If we have not a syringe at hand, we may, in desperate cases, dip a sponge or a piece of cloth in cold water, and carry it in the hollow of the hand up to the fundus uteri. Nay, ice itself has, with happy effects, been introduced into the womb. In general, however, the external application of cold will be sufficient to save the patient. I feel confident in advising it, and can say, without reserve, that I have never known any bad consequence result from it.

In those cases where the uterus is spasmodically contracted, we must slowly and cautiously dilate the stricture, so as to get the hand into the upper cyst of the uterus; and, in doing so, we shall be greatly assisted by applying cold water to the abdomen, or dashing water smartly on it from a brush or bunch of feathers. Afterwards, the same attention is to be paid to the contraction of the uterus as in the former case.

When it happens that part of the placenta adheres pretty firmly to the uterus, we are not to be rude in our attempts to separate it, but should remember that there can be no danger in being deliberate. It is too much the practice with some midwives, to trust more to their fingers than to the contraction of the uterine fibres; the consequence of which is, that they tear the placenta, and irritate the womb. Yet it is certain, on the other hand, that gentle attempts to separate it are sometimes necessary; but these should be so cautiously and deliberately made, as not to lacerate the placenta. The finger should be very slowly and gently insinuated betwixt the uterus and the placenta, so as to overcome the adhesion, which is seldom extensive. I have known the placenta retained for four days, by an adhesion not larger than a shilling. This case proved fatal by loss of blood, which continued to take place, I understand, in variable quantity during the whole time. No attempts were made to relieve the woman, until she was dying.

We can, in general, easily save the patient in flooding, if we are on the spot when it happens; but if much blood have been lost before we arrive, the strength may be irreparably sunk. In those cases where great weakness has been produced, we must not only endeavour to excite the uterine contraction in order to prevent farther injury, but we must also husband well the power which remains. The hand is to be immediately introduced into the womb, and must be kept there, moving it gently, until the fibres contract; and until this take place, neither the hand nor the placenta should be withdrawn. Cold water is to be dashed on the abdomen, gentle pressure is to be made by the hand on the region of the uterus, and the whole belly firmly supported with a bandage, provided that can be applied without moving the patient much. But as every exertion is dangerous, motion must be avoided, and upon no account is the patient to be shifted or disturbed for some time. By imprudent attempts to raise the patient, or "to make her more comfortable," she has sometimes suddenly expired.

The state of the stomach is to be watched, preventing as far as we can, that feeling of sinking which is apt to take place in all floodings. This is to be done by keeping up the action of that important organ with soup, properly seasoned, and given in small quantity, but pretty frequently repeated. Cordials, as for instance, Madeira, diluted or pure, should be given in small doses regularly for some time, to support the strength; but after recovery begins to take place, and the pulse steadily to be felt, they should be omitted or decreased; for if persisted in to the same extent, fever or inflammation may be excited. Powerful doses of opium have been given by some practitioners to support the strength; but as I cannot see that this medicine can do more than wine or similar cordials, and as it may suspend the muscular action of the uterus, I have not been in the habit of employing it, and therefore can say nothing respecting the practice from my own observation.

We must be careful neither to give nourishment nor cordials so frequently as to load the stomach, which produces sickness and anxiety, until vomiting remedy our error. This last symptom, when moderate, is not unfavourable, for it excites more powerfully the contraction of the womb. The rising of the pulse, and the relief of the patient after it, is to be ascribed not so much to any direct power which this operation has of invigorating the system, as to the consequent removal of sickness and oppression. If this effect do not follow from vomiting, the case is very bad.

When the hemorrhage has produced complete syncope, the state of the patient is very alarming. Yet the danger is not the same in every case, for some women faint from slighter causes than others. La Motte relates one case where the patient fainted no less than twenty times in the course of the night.

The patient is to be preserved in a state of the most perfect rest—the face is to be smartly sprinkled with cold water—a little wine artificially cooled, or what is sometimes more readily procured, a spoonful of ice-cream, should be given; for the sudden reception of any cold substance into the stomach, in these cases, rouses the system. Afterwards, warm spiced wine may be given in small quantity, and warm cloths applied to the feet. Frictions on the region of the stomach, with some stimulating embrocation, as hartshorn and spirits, may be useful. I need not add, that the patient must, in these awful circumstances, be carefully watched; and that, if the expression be allowed, we must obstinately fight against death.

It was at one time the practice to prevent the patient from sleeping, or indulging that propensity to drowsiness, which often follows hemorrhage*. But we can surely, at short intervals, give whatever may be necessary to the patient, without absolutely preventing sleep, or rather slumber, for the patient never sleeps profoundly. We are to attend so far to the advice, as not to allow the slumber to interfere with the administration of such cordials or nourishment as may be requisite.

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OF HEMORRHAGE AFTER THE EXPULSION OF THE PLACENTA.

WHEN the placenta is rashly extracted immediately after the delivery of the child, or suddenly taken away upon the accession of hemorrhage, then we find that the uterus does not contract properly, and the vessels pour out blood plentifully. This in part escapes by the vagina, but much of it remains in the cavity of the uterus, where it coagulates, and hinders the free discharge of the fluid by the vagina. But blood may still be poured out into the cavity of the womb, which becomes distended, and that often to a great size. Thus it appears that after delivery the hemorrhage may be sometimes apparent, sometimes concealed. When it flows from the vagina, it is always discovered by the patient; but when it is confined in the uterus, it is only known by its effects: the pulse sinks—the countenance becomes pale—the strength departs—and a fainting fit precedes the fatal catastrophe.

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* Even some modern writers have an opinion that sleep is directly injurious. "Somnus ejusmodi hemorrhagias recrudescere facit." Stoll. Prelectiones, vol. ii. p. 400.

Even when the placenta has not been rapidly extracted, hemorrhage may come on, and most frequently it, in this case, proceeds from rash exertion, or much motion. In an uncivilized state of society, we find that almost immediately after delivery, the parent is able to walk about; but women brought up in the European modes of life, cannot use the same freedom. Motion not only disorders the action of the uterus, and impairs its contraction, but also powerfully excites the circulation.

The continued application of a great degree of heat, mental agitation, and the use of stimulants, may also contribute to the production or renewal of hemorrhage *.

A partial or complete inversion of the uterus, is another cause of hemorrhage, and which can only be discovered by examination. I do not propose at present to consider this accident, but only remark, that even after the uterus is replaced, it may, from the injury it has sustained, be some time in regaining its tone, and thus renew the bleeding, if we be not careful to excite its action.

Sometimes a partial or irregular contraction of the uterine fibres takes place, and the person is tormented by grinding pains, accompanied by repeated hemorrhage †.

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* In one case I knew a most alarming hemorrhage brought on by improper attempts having been made on the patient soon after delivery.

† When the abdomen has been bandaged too tightly, the parts within are injured. The patient is restless and uneasy; the pulse is frequent; she complains of pain about the uterus; and numbness in the thigh. Sometimes the lochia are obstructed: sometimes, on the contrary, pretty copious hemorrhage is produced. Relief is obtained by slackening the bandage; by giving an anodyne; and if there be no hemorrhage, by fomenting the belly.

The retention of a small portion of the placenta, which has firmly adhered to the uterus, is also a cause of hemorrhage, and the discharge may be renewed for many days, until the portion be expelled.

It may also happen that, from some agitation of mind, or morbid state of body, the uterus may not go regularly on in its process of contraction or restoration *, to the unimpregnated state. In this case, the cavity may be filled with blood, which forms a coagulum, and is expelled with fluid discharge. The womb may remain stationary for a considerable time, and the coagula be successfully expelled, with slight pains, and no small degree of hemorrhage. These symptoms very much resemble those produced by the retention of part of the placenta, and cannot easily be, with certainty, distinguished from them. We have, however, less of the fœtid smell, and we never observe any shreds or portion of the placenta to be expelled whilst the coagulum, if entire, has exactly the shape of the uterine cavity.

Lastly, we find that if exertion have been used before the uterus has been perfectly restored, there may be excited a draining of blood, which does not come, in general, very rapidly; but, from its constant continuance, amounts ultimately to a considerable quantity, and impairs the health and vigour of the woman. This has been called menorrhagia lochialis.

When hemorrhage, whether external or internal, takes place, in moderate quantity, immediately after the expulsion of the placenta, and when the system does not seem to suffer materially, we may be satisfied with firmly supporting the uterus by external pressure, and applying a dry cloth closely to the orifice of the vagina. The blood thus coagulates in the uterus, which being supported by the external pressure or bandage, does not distend, and the action of its

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* This, at first, is owing to muscular contraction; afterwards, absorption forms part of the process. But if these operations shall be interrupted, or injured, then the vessels, which are still large, not being duly supported, will be very apt to pour out blood.

fibres is soon excited. After-pains are to be expected, but the fear of hemorrhage is removed. In some instances, when we have had no external hemorrhage, and the blood has been slowly poured into the uterine cavity, little inconvenience is produced for some time. But presently, by the pressure of the womb on the neck of the bladder, a retention of urine is caused, attended with much pain in the belly. This is in general instantly removed by introducing the fingers into the vagina, and raising up the uterus. If it should not, the catheter must be employed.

But whenever hemorrhage takes place to such an extent as to endanger the patient, and produce the effect I have already mentioned, then we must interfere more actively; and I need not attempt to prove, that the only security consists in uterine contraction. This is to be excited by the application of cold, and by the introduction of the hand, not simply to extract the coagula, but to stimulate the uterus, and rather make it expel them. Should this be tedious, it may be assisted by the injection of cold water into the womb. Afterwards we proceed upon the rules formerly stated for recovery; and we shall do well not to be in a hurry to quit our patient. In all cases of flooding after delivery, we should remain a considerable time in the house, for the hemorrhage may be renewed, and the woman be lost before we can see her.

When the hemorrhage proceeds from irregular action of the uterus, and is attended with grinding pain, a full dose of tincture of opium is of advantage, and seldom fails in relieving the patient.

If the placenta have been torn, and a portion of it remain attached to the uterus, the hemorrhage is often very obstinate. Both clotted and fluid blood will be discharged repeatedly. An offensive smell proceeds from the uterus, and at last the portion of placenta is expelled in a putrid state, after the lapse of many days. By examination, the os uteri will be found soft, open, and irregular.

If by the introduction of the finger we can feel any thing within the uterus, it should be cautiously extracted; but we are not to use force or much irritation either in our examinations or attempts to extract, lest we inflame the womb. It is more advisable to plug the vagina, and even the os uteri, so as to confine the blood, and excite the uterine contraction. We may also inject some cold and astringent fluid for the same purpose, or throw a full stream of cold water into the uterus, from a large syringe, by way of washing out the portions of it which have become nearly detached. A gentle emetic sometimes promotes the expulsion. The bowels are to be kept open, and the strength supported by mild and nourishing diet; but we must take care on the other hand not to fill the vessels too fast. If febrile symptoms arise, the case is still more dangerous, as I will presently notice.

When the hemorrhage proceeds from an interruption of the process of restoration, our principal resource consists in exciting the contraction of the womb by the use of clysters—by friction on the abdomen—by injecting cold and astringent fluids into the womb—by the exhibition of a gentle emetic—and by throwing cold water from a syringe upon the abdomen, when the womb is expelling the coagulum. We also check the hemorrhage, and save blood, by the prompt application of the plug, and diminish the action of the vessels themselves, by allaying or removing every irritation; by avoiding the frequent use of stimulants, or attempts to fill the vessels too quickly. The feeling of sinking sickness, tendency to syncope, &c. are to be obviated by the means already pointed out.

Lastly. The menorrhagia lochialis is to be cured by rest, cool air, the use of sulphuric acid or other tonics, and bathing the pubes with cold water. If the pulse be frequent, the exhibition of the digitalis for a short time will be of advantage. Pain in the back generally attends this disease, and is sometimes so severe, as even to affect the breathing. In this case, a warm plaster applied to the back is often of service; and if the pulse be soft, an anodyne should be administered. In slight cases, the application of cloths dipped in cold vinegar, to the back, does good.

I have formerly said that profuse hemorrhage may injure the uterus, and render its action irregular, or induce inflammation. This may be caused either by flooding before or after delivery. A fulness is felt in the belly—a pain more or less severe, sometimes excruciating, is felt in the hypogastric region, affecting the back, and extending to the groins. The discharge dries up, or greatly diminishes in quantity—the pulse becomes frequent and sharp—the patient is restless, thirsty, and sometimes has an inclination to vomit—the strength sinks still more—the pulse becomes fluttering—she lies in a slumbering state, or becomes incoherent, and by the third day dies; or, if the symptoms have been milder, and more protracted, shiverings come on with a dull pain about the pubes, shooting pains in the belly, thirst, profuse perspiration, and emaciation. The weakness increases, and the patient dies hectic; or the pus which is formed, is discharged into the vagina, or more frequently by the rectum, and it is only after very tedious suffering that the patient can expect to recover.

If the inflammation come on in a state of great weakness, we dare not bleed; and, indeed, can expect little good from that or any other remedy. We must be satisfied with fomenting the belly, giving emollient clysters, and throwing tepid water gently into the uterus. If the pain abate, the pulse becomes less frequent, and a bloody discharge flows from the uterus, the patient is likely to recover. The strength is to be supported by mild nourishment, the bowels kept open, and cordials or stimulants sedulously avoided.

If the patient have not been previously much reduced, but the pulse rather firm before the accession of the inflammation; or, if it be not feeble and thready, a vein should be opened, the bowels freely evacuated, and a blister applied to the abdomen.

When suppuration is about to take place, fomentations should be applied, the fœces and urine regularly evacuated, (the pressure of the uterus sometimes affording an obstacle to both,) and the strength supported by proper diet. When the abscess bursts, tonics should be given, and the patient removed to the country as soon as the strength will permit.

Both in the inflammatory and suppurative stages, the uterus will be felt enlarged, and its mouth open and irregular. In protracted cases, I have sometimes found the vagina much contracted and dry, having very little secretion.

Another consequence of hemorrhage, is to induce a very torpid or sluggish state of the bowels, by which the fœces come to be accumulated. This is apt to produce febrile symptoms, or a train of hysterical ailments, and, therefore, ought to be obviated by the proper remedies.

The stomach also is affected, and the woman is plagued with dyspepsia, in different forms. This is best removed by attention to diet, by moderate exercise, by the use of chalybeate medicines, and by keeping the bowels open.

The head likewise frequently suffers, and the patient is either tormented with head-ache, or sometimes attacked with palsy. The first is relieved by gentle exercise, bark, or valerian, with a course of some mineral water, combining a chalybeate with an aperient salt. The second is often relieved after a length of time, by applying a repetition of small blisters to the head, by the use of the warm bath, and by frictions.

It rarely happens that those who have suffered from hemorrhage are able to nurse. Even where milk is secreted in tolerable quantity, suckling is apt to produce a pain in the side or hysterical symptoms; but, should these abate, nursing may be permitted.

OF THE MANAGEMENT OF THE PLACENTA.

IN natural labour, the uterus, very soon after the delivery of the child, contracts so much as first of all to separate the attachment of the placenta, and afterwards to expel it. Until this be affected, the patient is always anxious; nor is she, indeed, altogether free from danger.

We have it not always in our power to prevent a tedious retention, but we can take some precautions which diminish the probability of its occurrence.

The most effectual of these consists in making the child be slowly expelled, by the contraction of the uterus alone. After the head is born, the child can be in no danger, although the body or extremities should be detained in the uterus for some time; and whenever this delay takes place, it is evident that a pause in the action of the uterus is requisite. If then we pull away the child, the womb does not contract properly, and we subject the woman to risk of hemorrhage. Even when the womb contracts briskly upon the child, and endeavours to throw it out suddenly, the action may be suspended after this quick exertion, and therefore we should retard expulsion when it promises to be too rapid.

After the child is delivered, the hand of the nurse, or assistant, ought to be placed on the abdomen, the cord tied and divided, and the finger run gently along the cord to the os uteri, to ascertain if there be another child in the womb. If there be, the expulsion of the first placenta ought, upon no account, to be hurried.

The placenta being expelled, the abdomen is to be properly supported by a broad roller: whatever is wet and uncomfortable, cautiously removed, and the woman left to repose.

But it sometimes happens, that the placenta is retained for a considerable time. This depends chiefly upon two causes: the first is want of brisk contraction; the second a spasmodic stricture of the body of the uterus. In some instances, the retention may also be produced by a morbid adhesion of the placenta to the uterus; but this is rare, and is only to be admitted as the sole cause, when the woman feels pain or efforts in the uterus, to expel without success.

I have already considered the retention of the placenta, which is accompanied with torpor or want of tonic contraction. The uterus is relaxed, and the vessels bleed profusely; but, in the present case, the tonic or permanent action still exists, and the uterus is felt hard and firm, the vessels are supported, and hemorrhage does not take place. We have, however, no expulsive action or pains, and the placenta is retained from the same cause, which sometimes interrupts or suspends the labour-pains before the delivery of the child. This suspension may continue for several hours; nay, it has been known to last even for days. When it continues beyond the usual time, we have no date by which we can determine how much longer it will remain. Now, it is evident that in this situation, the woman is in danger; for her only security against hemorrhage consists in the continuance of the tonic action of the uterus. But this is subject to variation; and when we have no expulsive action for a length of time, it is very apt to decrease. This cannot happen without hemorrhage, more or less profuse, being produced.

The uterus, after delivery, ought immediately to contract, and begin a new set of actions for the purpose of restoring it to the unimpregnated state. But as long as the placenta is retained, these cannot take place; if then for several hours, or for some days, we have much blood circulating in the womb, and the proper action at the same time not going on, there is much risk of inflammation. The woman becomes feverish, the belly is painful, and the vagina becomes dry. If in these circumstances the placenta be extracted, the irritation increases the disease, though not more than the continuance of the placenta would do; even the natural expulsion cannot often save the patient.

These evils will be greatly aggravated if the placenta become putrid, which it very soon does. There have, indeed, been examples where no bad consequence has followed, and the placenta, at the end of a fortnight, has been expelled with safety. But there have also been instances of large tumours being extirpated, or even, in extreme cases, amputated without hemorrhage. Would any surgeon, however, be justified in undertaking these operations without a tenaculum and ligatures. In general, we shall find that when the placenta is long retained, the patient becomes restless—the pulse quickens—she loathes her food—vomits—becomes greatly oppressed—sweats profusely—has the belly swelled, and tender—with an offensive discharge from the vagina—and dies in a very few days.

If to these evils we add those proceeding from that anxiety and fear which always seize the mind of the patient, when the placenta is retained longer than usual, we shall have no difficulty in concluding that such retention, so far from being harmless, is highly dangerous.

From a wish, however, to follow nature, and an overweaning confidence in her powers, many learned and ingenious men have made it a rule not to extract the placenta*. It has unluckily happened, that when they did not also make it a rule to remain constantly with their patient, she has been suddenly seized with flooding, and died before assistance could be procured; whilst, in other instances, fever and inflammation have come on, and the patient has perished with equal certainty.

Those who have had less confidence in nature, but yet have been willing to try her for a few hours, have been under the necessity of introducing the hand, after a tedious delay, and an interval of much apprehension, to the patient. It has sometimes happened, that contraction has taken place about the cervix, or os uteri, and rendered the extraction painful and difficult.

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* I at one time intended to have given an historical view of the sentiments of different writers on this subject, and for this purpose had made a very considerable collection of opinions, but I found that it would carry me to a greater length than is compatible with my plan.

From observing these dangers and difficulties, some made it a rule to introduce the hand immediately after the delivery of the child, and extract the placenta. But this practice is to be blamed as much for rashness as the other is for neglect; and not a few have in consequence, therefore, suffered fatally from hemorrhage.

I hope the reader will have anticipated the conclusion I mean to draw, that the placenta ought never to be permitted to remain in the uterus so long as either to produce danger, or to render it difficult or painful to extract it.

Very soon after the delivery of the child, we should tighten the cord a little, but are by no means to use any force with the intention of bringing away the placenta *. Our object is to excite gently the action of the womb. We then slip the finger along the cord to the os uteri, where we will feel some portion of the placenta, or at least be satisfied that there is no spasmodic stricture. Should the expulsion not take place in half an hour, we may gently move the cord, and press a little on the hypogastric region, rubbing the integuments over the uterus. A slight pain will, in general, expel the placenta; but, if not, we may, within an hour, slip the finger again to the os uteri, and press a little on that part of the placenta which is felt, and endeavour to move it downwards, but are by no means to attempt in this manner to extract. These attempts may be occasionally repeated; and if cautiously performed, will give no uneasiness, except what may result from the consequent expulsive motion of the uterus. If, however, within an hour and an half, or two

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* This will either invert the uterus, or tear the cord. When the cord is torn, we are deprived of a direct conductor to the placenta; but if in a case of this kind, we introduce the hand, the placenta is very readily distinguished by its veins and peculiar feel.

hours at farthest, from the delivery of the child, there be no prospect of expulsion, I should think it requisite to introduce the hand, and press on the placenta. This generally stimulates to contraction; but if it should not, the hand is very carefully to be insinuated betwixt the placenta and uterus, so as to detach it, and bring it into the hollow of the hand. This, however, will not often be necessary, for most frequently the presence of the hand effects both separation and expulsion. Sometimes, even the introduction of two fingers to make gentle pressure will be sufficient. If we find that part of the placenta adheres firmly to the uterus, the union is by no means to be speedily dissolved, but the finger should be passed betwixt them very slowly and gradually, and the separation patiently effected. Rash and speedy efforts uniformly tear the placenta, and are productive of much mischief afterwards. On the other hand, it is imprudent to withdraw the hand, without accomplishing the separation: the union is never so strong and complete as to make this impossible or dangerous, if we proceed cautiously; whilst, by delay, we subject the woman to risk of flooding, or other accidents, which may require the introduction of the hand at a period when it will be much more painful.

These observations apply to labour at the full time; and I can, without any reservation, say that I never have either known or heard of any bad consequence resulting from the practice recommended. It is, I believe, established by the experience of the best modern practitioners. It secures the patient from much danger, and removes a source of very great apprehension and alarm.

In premature labour, I apprehend, the practice should be a little different. The placenta is generally longer coming away, and flooding may take place. It removes much anxiety and risk to run the hand slowly along the cord into the uterus after the child is born, and to place the back of it on the surface of the placenta. In a short time we slowly move it, and press upon the placenta, which excites the uterus to throw it off, and expel it safely. On no account are we to be rash in detaching it, for its substance is very soft; it adheres longer to the womb than the placenta does at the full time; and we are apt to tear it, and leave part behind. If the child have been long dead, the placenta is sometimes extremely soft, and attempts to separate it would infallibly tear it, and leave a portion behind. Gentle pressure, and slow motion with the hand, make the uterus itself accomplish safely what it would be dangerous for us to attempt. I beg leave to add, that in premature labour, we must never pull the cord, for it is very easily torn.

If we are called to a case where the placenta has been recently torn, and part left in the uterus, we should certainly endeavour to extract it, by introducing the hand. But there may be difficulty in distinguishing the portion, if it be small, from the coagulated blood which lines the uterus; and I do not think that we are justified in scraping the womb, or picking at every thing which resembles placenta. This will do positive harm, whilst there is a possibility that the retained portion may be safely expelled. If, however, it be readily discovered, we are not hastily to tear it away, but rather press on it, and use cautious endeavours to make it separate.

But if the laceration have happened some time previously, and we are consulted respecting the proper management and probable event, then, ~~unless there be some urgent~~ and morbid symptom, we are not officiously to introduce the hand, for there have been examples where portions of the secundines have been spontaneously expelled with safety; and it may happen that no part has been left behind, but a false apprehension entertained.

The two principal dangers proceeding from retention of part of the placenta, are hemorrhage and fever.

The hemorrhage may proceed from the separation of part of the adhering portion, and the consequent exposure of vessels, or the whole uterus may be disordered in its action by the irritation and hemorrhage excited. We are to endeavour, with the finger, to extract the portion, but must not irritate the part. We must restrain the hemorrhage with the plug, and keep the patient very quiet, observing the rules formerly laid down. Throwing a stream of water into the uterus, sometimes washes out the portion which may have been adhering only by a few fibres.

The other danger proceeds from the accession of fever, with great prostration of strength, tumid belly, offensive discharge, loss of appetite, burning heat in the soles of the feet and palms of the hands, nocturnal sweats, nausea, and vomiting. These symptoms may vary in number and degree; sometimes they are protracted, and not very urgent; more frequently they are acute, and may soon prove fatal; sometimes they are complicated with hemorrhage.

By introducing the finger, the os uteri will be felt soft and open, which is always the case when any substance is retained in the womb.

If the portion can be felt, we may succeed in hooking it out with the finger. If it cannot, it is more expedient, instead of endeavouring forcibly and violently to dilate the os uteri, which may produce dangerous irritation, to throw in an injection of tepid water *, or infusion of chamomile flowers, from a large syringe, so as to wash out the uterus, and by a repetition of this, the portion will be brought away. If the person be tormented with nausea, a gentle emetic † will be useful; and this may also excite the uterus to brisk contraction. Incessant vomiting of food or drink is sometimes an attendant on this disease, and is to be stopped, if possible, by anodynes, the application of a small blister, or campho-

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* M. Recolin was amongst the first who advised injections to be thrown into the cavity of the uterus. Vide Mem. de l'Acad. de Chirurg. tom. iii. p. 202.—It is certainly highly desirable that the placenta should be removed; and when I forbid extraction, it is only rash and forcible dilation that I allude to.

† This was a principal remedy in the practice of Roderic a Castro. Vide De Morbis Mulier. p. 477.

rated plaster, to the epigastric region, and the proper management of the food, which should be light, and given in small portions. The bowels should be kept open, and the strength supported by a proper quantity of wine. Ripe fruits are also useful.

It remains to speak of the retention of the placenta, which proceeds from stricture. This almost uniformly is produced by hurrying the delivery of the child, or promoting it to be rapidly expelled. When we introduce the finger to the os uteri, shortly after the child is born, we do not feel the placenta; and if within half an hour, we cannot perceive it, and especially if we feel the uterus forming an irregular tumour in the belly, we may apprehend the existence of stricture.

If within an hour, we cannot feel any part of the placenta, our suspicion will be so far confirmed as to warrant the introduction of the hand. We carry it along the cord, and will soon find that the placenta is not in the lower part of the uterus; following the cord *, we shall be directed to a small aperture, through which the cord passes; and by introducing the finger into this, we shall perceive the placenta lodged in a separate sac or cavity of the uterus.

It is vain to delay in these cases, for the placenta may never be expelled: the woman may become weak, and die in a few hours; but more frequently inflammation comes on, and she lives sometimes until suppuration takes place. It is as vain to expect that opiates will dissolve this spasm: they have very seldom, indeed, any good effect. Our only safe resource consists in very slowly dilating the stricture, and endeavouring to get the hand, or at least the greatest part of it, passed betwixt the placenta and uterus, and slowly extracting it. But we are never to attempt to tear it through the

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* If the cord have been torn, we shall be directed to the placenta, by feeling the stricture and the aperture which leads into the cyst where the placenta is contained.

stricture with the finger, for it may be lacerated; and this advice is to be still more carefully attended to in premature labour, when the placenta is soft. If we feel much difficulty in passing the fingers, we may sometimes be assisted by placing suddenly a cloth, dipped in cold water, upon that part of the abdomen which corresponds to the fundus uteri.

FINIS.

THE

ANATOMY

OF THE

GRAVID UTERUS.

WITH

PRACTICAL INFERENCES

RELATIVE TO

PREGNANCY AND LABOUR.

WITH TWO ENGRAVINGS.

BY JOHN BURNS,

SURGEON IN GLASGOW.

NEW-YORK:
PUBLISHED AND SOLD BY COLLINS AND PERKINS.

1809.

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TO

ROBERT CLEGHORN, M. D.

PHYSICIAN TO THE ROYAL INFIRMARY,

AND LECTURER ON CHEMISTRY IN THE UNIVERSITY
OF GLASGOW.

AND

JAMES MUIR, Esq.

SURGEON IN GLASGOW.

GENTLEMEN,

PERMIT me to inscribe the following pages to you, as a small testimony of the respect which I bear to your professional eminence, as well as of the sense which I entertain of the friendship with which you have hitherto honoured me.

I am,
GENTLEMEN,
Your sincere Friend,
and Humble Servant,
JOHN BURNS.

GLASGOW, *George's Street,*
July 22, 1799.

PREFACE.

AFTER the Anatomical Description which the late Dr. William Hunter has given of the Gravid Uterus, an apology will, doubtless, be required for the present publication.

Dr. HUNTER's posthumous work is, without doubt, truly valuable and useful; but it is not so explicit on some points, as could be wished; and it is entirely deficient in those practical inferences and conclusions which are so essential to the student.

It might indeed be said, that these inferences may be drawn from anatomical data, by the student himself. But it could, with equal truth, be maintained, that every treatise on surgical operations was useless, as the student may draw the necessary knowledge from anatomy and physiology. It is the great excellence and recommendation of any practical rule, to arise evidently from the structure and functions of the human frame; and there can no higher praise be bestowed on it, than to say that any one might have discovered it by reflection. This may be said of every valuable and important axiom in physic; but how many would remain ignorant of these, if the discovery depended on their own exertions? The student must have some assistance in establishing a system of practice; he must be made acquainted with some principles and conclusions; he must be led a certain length ere he can venture to go forward himself into the ways of reasoning and deduction.

Anatomy deserves to be studied as an object of curiosity, and as the best subject which can enlarge and exalt our views of nature. But it is only useful to the surgical practitioner in two points of view; first, as the foundation of physiological knowledge; and, second, as the guide and director of practice, in every case where operations are required. Unless then we apply the study of anatomy to practice, or, in other words, make it appear, that every surgical rule and direction is to be deduced from the structure and action of parts, anatomical investigations are useless to the surgeon.

It is from these considerations chiefly that the following observations are offered to the public.

For many ages, the art of midwifery was founded on false and mistaken doctrines. Even at present, there are too many who attempt to practise it without any fixed and certain principles, proceeding upon a confused jumble of directions, unconnected with each other, and arising from no sure and evident source. But it will not be difficult to show, that this profession is founded upon as firm a basis as any other department of the healing art; and that if the student be well acquainted with the structure and action of the parts concerned in parturition, he requires no other direction in the practice of midwifery.

It is not, however, my intention, when I make this assertion, to encourage the student in disregarding the different valuable works which have been written on this art. Far be it from me to wish this. What are all these works but commentaries on anatomical points? Are they not extensions and illustrations of principles derived from the sure source of anatomy? And who can deny the utility and necessity of studying these? Experience daily testifies, that, from the same data, learned men draw very different conclusions, and teach opposite practices. This proceeds from the imperfection of our knowledge; from the difficulty of ascertaining the truth; and from our propensity to think differently from others. On these accounts, practitioners do not agree in their theories, and consequently differ in their practices; and it is only by careful study, and much reading, that the student can become acquainted with their various arguments, and judge of the comparative merit of their proposals.

The study, then, of any of the departments of the healing art, will require our greatest attention, exerted for the longest lifetime. Whoever aspires at eminence and respectability, must, by unremitting application, and diligent study, purchase that honour which he is solicitous to obtain. I know, that it is an opinion with many, that success in the medical world depends more upon interest than abilities. But I shall venture to affirm, that he who trusts to this maxim, and neglects the means of improvement, will find himself most miserably mistaken. No person will trust his own life, or the safety of those whom he holds dear, to any man, however powerful his recommendations may be, if he once detects him to be a blockhead. In the trifling and insignificant ailments to which every one is subject, his ignorance may not be perceived, and years may glide on without any great impeachment of his character. But sooner or later, difficult and important cases must occur; his treatment of these will not pass without observation; and his real character must be made known. If possessed of many friends, he may, for a time, procure concealment or palliation of his faults; but blunders, frequently repeated, must at last become notorious. If a man of fortune, he may, indeed, still hold up his head, and assume the language of defiance or unconcern; but if his own subsistence, or that of a family, depend upon his employment, what must the consequence be? I indeed pity such a man; and, far from insulting him in the midst of those misfortunes which he has drawn upon himself, I should remain silent; but, whilst the blow may still be kept off, and whilst useful knowledge may yet be attained by honest labour, silence must be criminal. The opportunity of preventing this unhappy event, still presents itself to every student, to whom the precious years of improvement remain yet unconsumed. I shall surely, then, be excused, if I again insist on the necessity of diligence and perseverance. If the future rank of the student, if even his very subsistence, if the hopes and expectations of parents, who have injured themselves, or the rest of their family, to procure him an education, depend upon his exertions, he surely cannot consider the subject as uninteresting.

Every one must be sensible of the time which it requires to procure practice, and the difficulties which a young man has to surmount. He may live long ere he be known, even by name; his rise must be very gradual; and one slow step after another must lead him forward. Those who are his elders will not fail to urge their superiority, and point him out as a person devoid of experience and useful knowledge. Let him then rouse himself, and, by diligence, steadiness, and a thorough knowledge of his profession, prove, that he is not inferior to those with whom he is to compete. Let him only lay down a fixed resolution to become learned. Let him attend diligently wherever attention is requisite: Let him mark out the road of industry, which others have pursued: Let him follow steadily in that path, and, sooner or later, in spite of every opposition, he must succeed. His success depends upon his own inclination. If he desire honour, respect, and independence, he has only to form the resolution, and he shall obtain his wish. In proof of this promise, I appeal to the history of almost every man of eminence. In France, many of the most distinguished surgeons were, at first, so poor, that they could with difficulty defray the expense of travelling to Paris to learn their art. In Britain, many of the most eminent practitioners have suffered severe hardships, both during their education and after they had begun to practise; and it is surely no small encouragement to the industrious student to recollect, that of all the celebrated men in physic, not one of them owed his advancement to money and interest alone. A good education, and a mind stored with useful knowledge, is, indeed, the richest patrimony which a father can bestow, or a son inherit.

It may be objected, that, although many have raised themselves by their own abilities, yet every individual is not to expect the same good fortune. But this is assuredly a mistaken remark. Any man who has a sound judgment and ingenious mind, which he chooses to improve, by every mean in his power, may reasonably aspire to honour in the profession, and hope to rival the greatest men, provided that he fixes upon such a local situation as shall not inevitably prevent his advancement, and that dissipation, or a propensity to low vices, do not arise as a barrier.

I have said, that every man may acquire honour and reputation, if he chooses; but it is very far from my intention, to represent the task as an easy one. He who trifles away his time, and who does not consider every hour as mispent which he does not employ in study; he who can stoop to examine a thing by halves, and who tries every expedient to satisfy his own mind, when he has only acquired a partial knowledge of his subject, never can, and never will succeed. He who resolves to be eminent, must first view the character of an eminent man; he must proceed step by step, studying one point after another, until he brings himself to a level with him; let him then try to get above him if he can. Let him look over all the divisions and subdivisions of his study; let him inquire wherein he is deficient; and whenever he finds a subject on which he is either ignorant or confused in his ideas, let him stop there, and examine it well, before he proceeds farther.

It may still, perhaps, be urged, that we find many ignorant men enjoying good business; but are not these men employed because better have not made themselves known in their vicinity. Is it reasonable to maintain, that because one blockhead succeeds, another shall also succeed, and the wise man shall fail? It is indeed true, that the generality of mankind are very incompetent judges of medical abilities, and therefore may, from accidental circumstances, raise a fool to some degree of honour; but, notwithstanding this elevation, the fool still remains known only in the little sphere in which he moves, whilst the name of the learned spreads to distant lands. Even this success of the ignorant man must be only temporary. Some one, better qualified than himself, may come and pluck off his false laurels. Some unfortunate case, or some dishonest trick, sooner or later, must unmask his character, and pitch him down to his proper station.

But I shall say no more on the injury which the student, by his negligence, will sustain in his character. I shall insist on a more important point, the life and safety of his patient, when he comes to practise. Need I remind him of those dangerous accidents which attend pregnancy and labour? Need I do more than mention those dreadful hemorrhages, which, from their impetuosity, are justly called floodings? Some of these may be stopped by easy means; but others require bolder operations, or increase, in proportion as they continue, ending only with the life of the patient. Can any man, laying the most distant claim to humanity or honour, be easy when he is ignorant of these points? Can any one, not well acquainted with his profession, pretend to thrust his hand and arm into the uterus, and procure artificial delivery? Will he presume to say, upon his own judgment, when it is necessary or safe, and when it is not? Should he stop to deliberate, if the reasoning of such a man can be called deliberation, may not the woman die before his eyes, and without assistance? Can he, without uneasiness, attend the more lingering illness, produced by the fruitless efforts of the uterus, to push the child through an ill-formed pelvis? Will he dare, in any one instance, to determine, upon his own authority, when the head should be opened and the crotchet employed? Must the child be wantonly sacrificed, because he, in his ignorance, believes it to be requisite? or, must the woman perish, because he foolishly hopes that assistance is still unnecessary? Must both parent and child become victims to his awkwardness? It is a very poor excuse for these crimes, to say, that he had no malice in his heart. The laws of his country will indeed acquit him; but his own conscience must tell him that he is a murderer. It is only a small alleviation of his guilt, to say, that he did the best he could. It was unwarrantable and criminal to undertake the practice of a profession for which he was not qualified.

It will surely be unnecessary for me to point out the reverse of this character, or to mention the happiness which the true surgeon derives from his knowledge. By the operation of a single moment, he restores life to the dying. In the midst of every danger, he is courageous, because he knows his own powers and resources. His life is spent with honour to himself, and advantage to others; and his departure is beheld with sincere grief, by those who had the happiness of being connected with him.

These remarks may, by some, be thought unconnected with the subject of the following pages. But, if I am not much mistaken, the anatomy and physiology of the Gravid Uterus is the basis of all obstetric knowledge. Surely, then, these remarks cannot be improperly placed before the elements of midwifery.

I at one time intended to have given a regular set of plates along with the description; but, when I considered that this subject might be easier understood without sketches than perhaps any other part of anatomy, and that Dr. Hunter had published a very elegant and accurate system of engravings, I gave up the design.

THE ANATOMY OF THE GRAVID UTERUS.

INTRODUCTION.

THE importance of anatomy to the surgeon has been long and universally acknowledged; but the accoucheur has been, by too many, supposed to draw his principles from a less certain source, and to practise a profession which owed less to true science, and more to fortuitous circumstances, than any other department of medicine. But midwifery is indeed a branch of surgery; its operations are the same; and he who is qualified to practise the one, may practise the other also; for in both, anatomy is the guide of all his steps. He who pretends to exercise either the one or the other, without an accurate knowledge of the structure of the parts concerned, is either foolish or criminal: his operations are conducted without any principle or direction; and their success is prosperous or adverse, just in proportion to the possibility which the case admits of error.

There is nothing either difficult or mysterious in the science of midwifery. In a natural labour, the accoucheur knows that he is only the spectator of the progress of a natural action. But, in every case of diseased labour, in every instance where his interference is requisite, or his presence truly necessary, a knowledge of the structure and action of the uterus, and the connexion of the child, is indispensable. I cannot, then, be wrong in maintaining, that the anatomy of the gravid uterus is the very foundation of the art of midwifery; and that he who knows it well, can only fail in his operations from the same irremovable and unforeseen causes, which so often render the operations of common surgery abortive, although performed by the most expert anatomist. He who is ignorant of this subject, can only practise with impunity in those cases where the assistance of art is useless; and even here he is only safe whilst he remains a mere spectator. He can neither fully foresee those events which the anatomist may prepare for, nor can he know how to remedy the evil when it does occur.

In studying the anatomy of the gravid uterus, there are two points which demand our attention:—*First*, The changes which the womb itself undergoes; *Second*, The contents of the uterus. These I shall proceed to examine regularly.

General Observations on the Size, Figure, and Relative Situation of the Uterus.

When we compare the unimpregnated with the gravid uterus at the full time, we must be astonished at the change which has taken place during gestation, in its magnitude alone.

In the ninth month, the size of the womb is so much increased, that it extends almost to the ensiform cartilage of the sternum; and this augmentation it receives gradually, but not equally, in given times; for it is found to enlarge much faster in the later than in the early months of pregnancy.

For a considerable time after conception, the uterus receives a very slow and trifling addition to its bulk; and, instead of rising higher up into the belly, it falls, from a cause which will be afterwards mentioned, rather lower down. It is not till towards the end of the third month, that the uterus can be felt rising above the pubes; although, at this period, it generally measures from the mouth to the fundus about five inches, one of which belongs to the cervix. In the fourth month, it reaches a little higher, and measures five inches from the fundus to the beginning of the neck. In the fifth, it has become so much larger, as to render the belly tense, and may be felt, like a ball, extending to a middle point betwixt the pubes and navel, and measures about six inches from the cervix to the fundus. In other two months, it reaches to the navel, and measures about eight inches. In the eighth month, it ascends still higher, reaching to about half way betwixt the navel and sternum. In the ninth month, it reaches almost to the extremity of that bone, at least in a first pregnancy, when the tightness of the integuments prevents it from hanging so much forward as it afterward does. At this time it generally measures, from top to bottom, ten or twelve inches.

These calculations are not invariably exact, suiting every case, but admit of modifications, depending on the size of the woman, on the number of pregnancies, on the number and size of the fœtuses, and especially on the quantity of water which the membranes contain.

The uterus, when unimpregnated, is of a flat triangular shape; but this, when gravid, it gradually loses sooner, however, to external appearance than within; its cavity retaining more or less of this shape for two or three months. The figure of the gravid uterus has been compared to an egg or a pear: but when we consider that every part of the uterus does not change equally in the same period, we shall find that this comparison will only be just in the end of pregnancy, and not at all applicable in the earlier months. In these the upper part or body of the uterus alone distends, whilst the thickened neck remains projecting and unexpanded.

At every period, the uterus is somewhat flattened; its greatest breadth being laterally. This, at first, depends on the natural shape of the uterus not being completely changed by distention, and afterwards on its being pressed between the spine and abdominal parietes. This pressure of the neighbouring parts, together with the irregular figure of the child, must produce a variation in the shape of the uterus, not only at different periods of gestation, but even at different times of the same day; for until its muscular fibres contract in labour, the uterus is never tense, but yields in one place, whilst it bulges out in another.

The uterus, whether gravid or unimpregnated, never rises straight up, but is always inclined obliquely, either forward or backward. In the latter state, the top of the uterus lies backward toward the rectum, whilst its mouth is directed forward. But in pregnancy, the situation is reversed; for then the mouth of the uterus is directed backward, whilst the fundus lies forward. This uniformly happens in pregnancy; but the change does not take place until the uterus begins to rise out of the pelvis. This obliquity, however, exists in a greater degree in those who have born many children; for in them the integuments are loose, and the linea alba yielding from former distentions, by which the uterus is allowed to project more forward than in a first pregnancy.

From this it appears, that the intestines can never be before the uterus, but must lie behind it, and all around its sides *; whereas, had the uterus mounted up in the same direction which it assumes when unimpregnated, the intestines must have been before it, and the great vessels would have been pressed betwixt the fundus uteri, and the spine. This would have been a very dangerous, if not a fatal circumstance; but it never can happen, as is evident from the anatomy of the mesentery, which is a fixed point behind, tying the intestines to the back-bone, and from the direction of the axis of the pelvis, conjoined with the weight and elongation of the uterus when gravid. These causes must always make the uterus fall forward.

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* By examining the abdomen of the living woman, we can feel the uterus in the middle; and by patting with the finger around it, we may hear a hollow sound from the air which the colon and intestines contain.

Three consequences result from this obliquity. First, the uterus makes a more acute angle than formerly with the vagina, and its axis becomes nearly * the same with that of the pelvis, by which it can more easily force the head of the child through the superior aperture.

Had the uterus remained in the same direction as when unimpregnated, (which is impossible,) a line drawn through its axis would, if produced, have struck on the lower part of the symphysis pubis. Had it again risen straight up, the line would have passed only at a little distance from the pubes. The first effect of labour, is to press the head of the child against the os uteri, and thus dilate it, which would have happened with difficulty, in this supposed state of things; because, as the os uteri is always in the axis of the uterus, the vicinity of the bone to this point would have taken off part of the force, and, by impeding the dilatation of the mouth of the womb, have rendered labour tedious.

Even the projection forward, or anterior obliquity, as it is called, has been supposed, and justly, to render labour difficult, if it exceeded the due degree. The same consequences will follow from this obliquity, if to a very great degree, which would result from the former supposititious situation; only the sacrum, instead of the symphysis pubis, will be the impediment. But this deviation does not commonly exist to such an extent as materially to affect labour, or to require any manual assistance. It still more rarely proceeds to such a degree, as to produce those very serious consequences which were once very currently attributed to it. By a very great obliquity, it was imagined, that the labour would not only be rendered very difficult and tedious, but also that the child would be killed, by having its head

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* I have said *nearly*; because a certain degree of obliquity generally exists; the os uteri being directed to an intermediate point betwixt the axis of the pelvis and the projection of the sacrum. But when labour commences, and the uterus descends, its mouth comes pretty nearly, if not exactly, into the axis of the pelvis.

pressed against the sacrum. To remedy this, it was deemed, at all times, requisite, not only to press back the fundus, and elevate the breech, but also with the finger, to pull forward the os uteri. It was even said, that the obliquity might be such as to prevent the delivery of the child by any labour, however long. The os uteri being very far back, and high up, it was imagined that the expulsive force of the uterus, would be directed against its lower and anterior portion, which was in the axis of the pelvis; and that thus the head of the child would be protruded, covered with the uterus *. This may be the case; but it may also occur, in a very wide pelvis, without any obliquity; the uterus being thus allowed to prolapse, the head descending before the os uteri is dilated.

Too great obliquity of the uterus, and the consequent deviation of its mouth from the axis of the pelvis, or the most advantageous situation, will, it must be admitted, protract labour; but in almost every instance, a change of posture, or elevation of the pelvis, will be sufficient to remove it. Difficult labour, however, from this cause, is very rarely met with by practitioners, now that they have ceased to seek for it.

What has been said on this subject, will also apply to the lateral obliquity, or those cases in which the uterus is turned too much to one side.

The second consequence of this obliquity is, that a pressure is made on the bladder, producing incontinence of urine, which is only to be relieved by a recumbent posture.

In the first months, a retention of urine is likewise sometimes produced by the pressure of the uterus against the cervix of the bladder. This, when urgent, may be relieved by removing the pressure of the uterus with the finger, or

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* In such cases, without careful examination, it might at first be suspected, that the os uteri had grown together, or was entirely wanting; instances of which authors have not been unwilling to record.

by introducing the catheter; but, in general, the disease disappears soon, without requiring any assistance.

The third consequence is, that the pressure of the uterus is taken much more, and much sooner off the rectum, than it otherwise would have been. If it had continued for some time, in its natural position, the intestine must have been much compressed: But to avoid this, and the obstinate costiveness which it would have induced, the uterus, owing to the inclination of the pelvis to the horizon, generally projects, whenever its upper part begins to distend and grow heavy.

Besides this deviation of the uterus, there is another, which takes place in the earlier months, and which demands our serious attention, from the consequences which it sometimes produces: I mean the retroversion of the uterus.

This is a disease, which, in many instances, depends upon the connexion of the uterus with the bladder, which is so intimate, by means of the peritoneum and cellular substance, that whenever the bladder rises by distention, the uterus must rise also. Now, as the bladder is globular, and the point of adhesion between the two organs is only at the inferior part, it follows, that the uterus must go off, as a tangent, from the globe of the bladder, its fundus being thrown farther back, at the same time that its orifice is carried higher up. This happens in every case of retention of urine. It is evident, that if, during this position, pressure be made from above upon the fundus uteri by the intestines, or if the fundus contains any thing which makes it heavy, it must be pushed lower down, by which the uterus will come either to lie horizontally across the pelvis, or may be turned completely upside down.

This does not often happen to the unimpregnated uterus; because there is in that state seldom any sufficient gravitating cause applied to the fundus: but, in gestation, there is a period in which the fundus becomes sufficiently heavy from the ovum which it contains, and yet is not so much distended as to prevent its being turned down into the pelvis. This period is about the third or fourth month, often before it, but never after it.

Besides this cause, which produces frequently a sudden and immediate retroversion of the uterus, this disease may likewise be produced by the uterus remaining too long in that situation which is natural to it when unimpregnated, namely, with its fundus inclined backward. This may depend on various causes; such as, too great width of the pelvis, or the pressure of the ilium, full of fœces, on the fore part of the uterus. In this case, the weight of the fundus must gradually produce a retroversion, and we shall be sensible of its progress from day to day; whereas the other takes place suddenly.

In this disease, by introducing the finger into the vagina, we ascertain that the os uteri is raised much higher, and thrown more forward, so that sometimes it cannot be felt. By the same means, or by the finger in ano, we discover a hard tumor, formed by the fundus uteri, pretty low down, between the vagina and rectum. These are the distinguishing marks of the disease; and we are led to suspect its presence by the following symptoms:—There is a sense of fulness and weight at the fundament, tension in the groins, and an inability to void either urine or fœces, owing to the pressure on the neck of the bladder and the rectum. These conditions of the bladder and rectum, and the retroversion of the uterus, act reciprocally, as cause and effect; for the continuance of the distention of the bladder, and the descent of the fœces from the part of the intestine above the obstruction, must elevate still more the os uteri, and depress, to a still greater degree, the fundus. The retroversion, on the other hand, increases the affection of the bladder and rectum, from which the principal danger of the disease arises.

The cure consists in emptying the intestine by clysters, and removing the distention of the bladder by the catheter, whilst we attempt to push up the fundus with the finger.

But our great object is first to procure the evacuation of the urine, after which the rest is more easily accomplished: or, if the reduction be at that time impossible, it may be performed afterwards, or may gradually take place of itself, provided that we prevent the bladder from becoming again distended, and the rectum from being filled above with fœces. In urgent cases, when the suppression of urine threatened a fatal issue, it has been proposed, other means failing, to lessen the bulk of the uterus by tapping. Nor can there be a doubt of the propriety of preferring this, even supposing abortion uniformly to follow it, to the greater evil which results from continued suppression of urine.

In some cases, the orifice does not rise up, but the fundus turns down, doubling on its neck, which bends. This more frequently happens after delivery, before the parts have assumed their proper size and firmness. It has received the name of retroflection; but its treatment is the same.

At other times, though very rarely, the fundus turns forward and downward, between the cervix uteri and bladder, whilst its mouth is felt upward and backward. It is named anteversion; and, in this also, the treatment and symptoms are similar to the retroversion.

After these remarks, it will surely be unnecessary to insist upon the impropriety of pregnant women either retaining their urine for a long time, or permitting themselves to remain costive.

These observations being made upon the size, figure, and relative situation of the uterus, it will next be proper to take notice of the successive expansion of its different parts, and particularly of the changes which take place in the cervix and os uteri.

Of the Changes effected during Gestation upon the Fundus, Cervix, and Os Uteri.

Immediately after the descent of the ovum, and perhaps some time before it, the uterus begins to enlarge at its upper part or fundus. By what cause this dilation is effected, it is difficult to say; but it is evident, that it is not from the distention of the ovum *; because this does not appear to be possessed of strength or force sufficient to effect the purpose. Even if it were, it could only distend the sides of the uterus, but could not prevent them from growing thinner. We must, therefore, refer it to an action of the uterus itself, similar to that which produces and regulates the increase of other parts of the body at certain periods †.

It is somewhat singular, that the posterior face or side of the uterus distends more than the anterior one, as we ascertain by examining the situation of the orifices of the Fallopian tubes ‡. The greater distention of the posterior part of the uterus, will evidently prevent it from pressing so much on the bladder as it otherwise would do, when it is contained in the pelvis; for, by this mode of distention, the most protuberant part of the uterus will correspond to the sacrum.

When the fundus begins to increase, it not only grows heavier, but also presents a greater surface for pressure to the intestines above: it, therefore, will naturally descend lower down in the pelvis, and thus project farther into the vagina. In this situation the uterus will remain, until it becomes so much distended, as to raise itself up by pressing

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* This is rendered certain, by our finding the uterus enlarged, when the ovum is contained in the ovarium or Fallopian tube.

† The increase or distention of the uterus, in the early months, may be ascertained, by introducing the finger into the rectum, at the same time that we examine the state of that part which can be felt per vaginam: afterwards, we estimate it by pressure on the abdomen.

‡ From particular circumstances, the uterus may sometimes expand in a very irregular and uncommon manner. Dr. Hunter mentions a case which occurred in the practice of the late Dr. M'Kenzie, where the uterus stretched out into two distinct bags or cavities, in each of which a child was lodged. Sometimes the unimpregnated uterus expands out at the entrance of each tube, like the cornua of the womb of the quadruped. This might have been the original structure in Dr. M'Kenzie's patient.

against the sides of the pelvis*. By introducing the finger into the vagina at this period, we can feel the os uteri prolapsing farther than formerly; and this is considered as one of the most early marks of pregnancy, existing before the uterus can be felt by the hand above the pubes, and consequently before it has swelled the abdomen. The belly is indeed tumid before this happens; but the swelling is chiefly occasioned by the inflation of the intestines.

Although the uterus, about the third month, has enlarged so much, as notwithstanding its prolapsus, to be felt rising above the pubes, yet it is not this stretching which accoucheurs allude to, when they say that the uterus now begins to ascend. By this they understand the elevation of the os uteri; first to its original height, and afterwards beyond it, which takes place whenever the body distends to a certain degree: because, in proportion as the body of the uterus enlarges, and becomes too broad to be contained in the cavity of the pelvis, it must raise itself up, the brim being a fixed point which cannot yield. The whole of the uterus, therefore mounts up, and the vagina becomes elongated†.

Until this ascent of the uterus, the fundus and body form the whole of the cavity; but now the cervix begins also to be stretched out; so that by the end of the fourth month of pregnancy, one-quarter of its length has become distended, and contributed to augment the uterine cavity; the other three-fourths, which remain projecting, become considerably softer, rather thicker, and more spongy. By introducing the finger into the vagina, and at the same time that we press on the lower part of the abdomen, to keep the uterus from rising up, we may feel the expanded body of the womb; and by making a kind of waving or circumgiration with the finger, we can now make it exhibit a species of rolling or circulatory motion. If the uterus be kept steady, we may also feel an obscure fluctuation, from the water which it contains.

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* From this circumstance of the uterus falling down lower into the pelvis, it must be a longer time in stretching above the symphysis, than if it had remained at its original height.

† This elongation is also increased by the obliquity of the uterus, for the falling forward of the upper part necessarily pulls up the lower part, or os uteri.

In another month, one half of the cervix is distended, and the rest is still more thickened; or the circumference of the projecting part greater*; the uterus has also risen farther up; consequently, the vagina is more elongated. In the sixth month, the neck is still more stretched; and, in the seventh, it is difficult to discover any projection from the body into the vagina, which is still longer. At this time, by pushing the finger higher up, we can distinguish the head of the child, pressing on the lower part of the uterus, which we can seldom do, before this. In the eighth month, the neck is completely effaced, and its orifice is as high as the brim of the pelvis. The ninth month affects the mouth of the uterus chiefly; and, therefore, the changes in this period, must be considered afterwards.

These alterations of the cervix, are discovered by introducing the finger into the vagina, and estimating the distance betwixt the os uteri, and the body of the uterus, which we feel expanding like a balloon.

The mouth of the uterus is merely the termination of extremity of the cervix, and consists of two flat lips or margins, of the same consistence with the rest of the uterus. When the womb is not gravitl, these are always open, and will admit the tip of the finger: but soon after conception, the os uteri becomes closely shut up, except at the very margins, at the same time it gradually becomes softer. In proportion as pregnancy advances, and the cervix stretches, the tubercles of its extremity, or its mouth, shorten, until they totally disappear; so that when the neck is fully distended, there can no longer be felt the thick margins of the os uteri. It is now quite flat, very thin, and irregular in its aperture; for, as the lips never unite closely at their very extremity or margin, it follows, that a small cavity (the bottom of which is the inner surface of the undistended portion of the cervix) must, in all the months, be perceived. From the same cause, there must always, in the end of pregnancy, be a small hole, from the complete developement of the parts, through which we might touch the membranes, were it not filled up with mucus.

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* Although the cervix distends in this ratio, yet it does not expand abruptly to form the uterine globe. The dilatation takes place gradually; on which account the lower part of the uterus has, about the sixth month, the appearance of an inverted truncated cone. This tubular or conical part, is filled with the waters, and contains no part of the child. The head cannot, therefore, be felt, until the cervix expands more into the globular figure, which happens towards the end of the seventh month.

When the cervix is in this state, it is pliable, and bends easily. It, therefore, owing to the figure of the bladder co-operating with the nature of the fixture below, and the weight directing the uterus forward above, assumes a slight incurvation. In this way, the bladder is not so much pressed, as it otherwise would be, and the os uteri is not thrown backward so soon. This last circumstance may be attended to in examination.

The lower part of the cervix, in the course of gèstation, and the inner border of this opening, in the ninth month, for about an inch all around, is full of small cavities or glandular follicles, which secrete a thick viscid mucus. This extends from one side to another, and fills up the mouth of the uterus very perfectly, being thus interposed as a guard betwixt the membranes and any foreign bodies. By maceration, this may be extracted entire, when a mould of the lacunæ will be obtained by floating it in spirits, saturated with fine sugar. Before labour, it separates and comes away, after which the glands pour out a thinner fluid, which lubricates the parts. But the outside of the orifice, and the upper part of the vagina, contribute still more to the production of this secretion. Immediately before labour, or after the first pains, the discharge is tinged with blood, which proceeds from a trifling separation of part of the decidua.

The situation and position of the os uteri during gestation, may be learnt from what has been said concerning the cervix, of which it is only the extremity. It may, however, be proper to add, that, at the end of the ninth month, and before the commencement of that more perfect action, called labour, the fundus uteri begins to contract a little, and very gradually, which forces the child more completely down to the bottom of the uterus, and makes it press more on its mouth. In consequence of this, the uterus seems to subside, and does not reach so high up in the abdomen, whilst the mouth descends a little. This descent is, however, very trifling, until the stronger contraction, called labour, begins. When, therefore, the os uteri remains high up, whatever pain or uneasiness the woman may feel, delivery is not at hand, nor is she in real labour, unless the os uteri descends during every increase of pain.

These changes of the neck and mouth will, perhaps, be better understood, if we attend to the ultimate object of the uterine action, which is to expel the fœtus. The extension of the uterus, and the increase of its cavity, is intended to contain and preserve the child, and its different appendages; but it has also a reference to labour, which it would be very improper to lose sight of. The fundus first distends, affording a lodgement to the fœtus in the earlier months, and might undoubtedly have yielded still more, so as to contain the full grown child, without any assistance from the distention of the cervix, had a lodgement been all which was requisite. But, in order to assist expulsion, or even to render it practicable, it is necessary, that the cervix should yield; and it is more upon this account, than for the purpose of containing the child, that this part of the uterus distends. The final intention of all the changes of the cervix and mouth of the womb, is to render the uterus one cavity with the vagina.

The uterus and vagina may be compared to a sand-glass, the middle or contraction of which is the cervix and os uteri. Before then that a body can pass from the one end to the other, the contracted part must yield, and the whole become only one canal. The chief business of the latter months of gestation, is to obliterate or distend the neck, whilst the primary object of labour is to open the mouth, and destroy completely the division betwixt the uterus and vagina *. The first of these changes takes place gradually during pregnancy, the second rapidly during labour; and all the steps are simple and regular in their gradation.

Sometimes, though rarely, the os uteri has its intimate structure changed, becoming tendinous or semi-cartilaginous. In this case, the efforts of the uterus are fruitless, and delivery cannot be accomplished without a division of the diseased part. In this case, no dilatation, or a very trifling dilatation takes place; the throes are very severe until their continuance exhausts the action of the uterus; the membranes do not protrude, but often the waters ooze out; the uterus descends, and approaches nearer to the vulva, by which we can better feel the hard structure, and may even at last almost see it. This may be remedied, by making an incision through the os uteri, on each side, which is attended with little pain, and scarcely any hemorrhage, the part being, in this state, very destitute of large vessels.

From these observations, two practical conclusions may be made:

First, When the cervix and os uteri are higher or lower than natural, by which I mean, than when unimpregnated; when the circumference of the cervix, or projecting portion, is increased, and its length lessened; and when the body of the uterus can be felt expanding, like a balloon; when the os uteri is softer, and the finger cannot be passed into it

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* I shall suppose the uterus and vagina to be one continued substance, but of different shapes; that the vagina is a cylinder, and the uterus an ellipsis; and that at the junction of the two, the part is contracted so as to form a valve: Lastly, that the end of the ellipsis projects, for a little way, within the cylinder. If we wished to destroy this contraction, we would first pull up the projecting part of the ellipsis from the cylinder, and then dilate the purse or mouth; we should thus form a cone, the base of which would represent the fundus uteri, and the apex the orifice of the vagina.

as formerly; and when the sympathetic signs of pregnancy are present, we may pronounce the woman to be with child, and judge of the period by the facts already stated. We ought, however, not to be too confident for the first eight or ten weeks; because then the cervix has not begun to distend, and the signs are more fallacious than afterwards.

Second, When the os uteri has no longer any distinct lips, but becomes very thin, we may consider labour as not many days distant; when the fundus subsides, and the uterus begins to contract a little round the child, which is always attended with more or less pain, and when the mucus begins to flow, we may consider labour as almost begun; when the pain increases, and the mucus becomes tinged with blood, and when the orifice begins to open and descend farther down *, we may consider the woman to be in actual labour, and are to judge of its progress by the descent of the orifice, by the degree of its dilatation, and the quantity of the child's head which is contained in the pelvis †.

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* When we introduce the finger at the commencement of labour, we strike against the anterior and lower rounded portion of the uterus, which forms a segment of a circle, reaching from the bladder or pubes to the rectum or sacrum. At the back part of this we find the os uteri more or less open, tense during pain, but thick, soft, and as if chopt, during the intervals. The plane of the orifice, at this time, is nearly parallel to that of the superior aperture of the pelvis, and a little farther dilatation brings it exactly into the axis of that aperture. When the child's head passes the rim of the pelvis, and turns forward, it then gets into the vagina, and thus into the axis of the inferior aperture.

† EXPLANATION of the ANNEXED PLATE.

These figures represent the different changes which take place during gestation, in the appearance and situation of the cervix and os uteri.

Fig. 1. Is a lateral section of the uterus and vagina, in the unimpregnated state, intended to show the position of the uterus relative to the vagina, and the appearance and projection of the os uteri.

Fig. 2. Shows the first change which impregnation produces. The uterus has fallen lower down, and projects more forward. This is the appearance in the second month.

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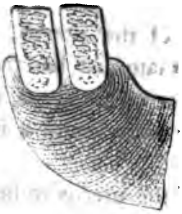

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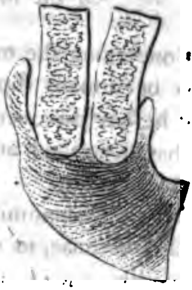

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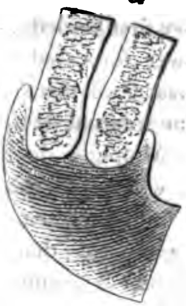

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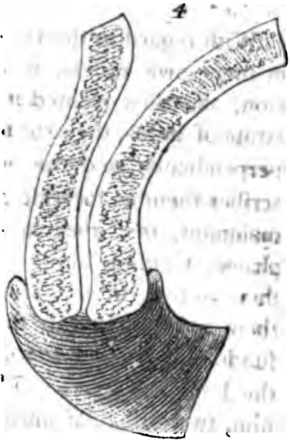

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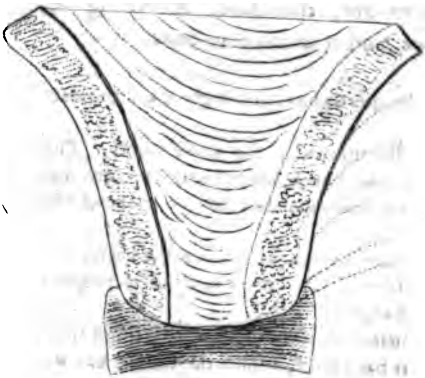

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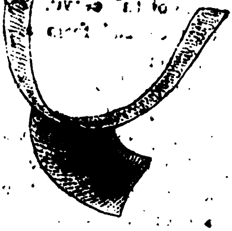

F. Kearny, Sc

Of the Muscular Fibres of the Uterus.

Concerning the muscular structure of the uterus, there have been many diputes; and every anatomist has thought that he has discovered some new course of the fibres, which he has described and painted, as if it were really a matter of importance.

The old anatomists readily allowed the uterus to be muscular; because, in opening cats, they found it contract and move like one of the intestines. But, in the human race, this contractibility does not manifest itself until the period of parturition.

With regard to the course of the strata, they first settled, in their own minds, which would best answer for expulsion, and then painted it. Thus Vesalius describes three strata of fibres, the external one transverse, the internal one perpendicular, and the middle one oblique. Malpighi describes them as forming a kind of net work; whilst Ruysh maintains, that they appear at the fundus, in concentric planes, forming an orbicular muscle. Others said, that they were bent to various arches. Dr. Hunter * paints them as transverse in the body of the uterus, but, at the fundus, describing concentric circles around each orifice of the Fallopian tubes. There are, therefore, according to him, two orbicular muscles, and a transverse one.

Fig. 3. In the fourth month, the uterus has risen higher, and projects more forward.

Fig. 4. Is a lateral section of the uterus, in the sixth month. The sides of the cervix are pressed nearer each other by the rectum and bladder, and form a slight curve, corresponding to the globe of the bladder.

Fig. 5. Is a front view of the same uterus, and shows the cervix expanding out in a trumpet-like form. The cervix or os uteri projects for only a very little way into the vagina.

Fig 6. Shows the complete distention of the cervix at the full time, and the direction of the os uteri backward, before the uterus has descended in labour.

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* Vide Hunter's Plates, plate xiv. fig. 1.

These contradictions of anatomists serve to show, what may readily be seen by examining the uterus, that the fibres are not very regular and distinct in their course, but exhibit confusion, rather than any well marked figure.

The increase of the uterus is by no means owing to the addition of muscular fibres; for it is far from being proved, that there are more of these in the ninth than in the first month. Their size, however, is larger; but this does not contribute so much to the increase as the enlargement of the blood vessels, and perhaps the deposition of cellular substance. This gives it a very spongy texture, and makes it so ductile, that a very small aperture may be greatly dilated, without tearing.

It was, at one time, believed, that as the uterus extended, it also grew thinner. Next anatomists went into the opposite extreme, and declared it to be thicker; whilst a third set maintained it to be always the same. But dissection proves to us, that although the whole uterus does not grow thinner in proportion to its increase, yet it does, at the full time, become thinner near the mouth, whilst the fundus continues the same, or perhaps grows a little thicker, at least where the placenta is attached. This statement, however, is only to be understood as correct, when the uterus is not injected; for, when the vessels are well filled, it becomes greatly thicker.

The course of the muscular fibres is of very little consequence to the accoucheur; but it is of the utmost importance that he should be well acquainted with their action. Naturally, the uterus remains torpid, and just like a membraneous bag, until the end of the ninth month. At this time, it begins to act, contracting a little in every point, but especially at the fundus. By degrees, this contraction increases, and, along with it, the pain; but the action is very imperfect, and does not tend immediately to expulsion; for the os uteri contracts at the same time with the rest of the uterus, whilst it dilates in true labour. This we know by introducing the finger. Very soon, however, a more perfect contraction takes place in the fundus and body, whilst the os uteri gradually relaxes and dilates *. The membranes, filled with the waters, protrude slowly, which prevents the head from engaging immediately in the pelvis. It is, therefore, at this time, higher up than after the membranes burst, and cannot be felt distinctly even during the absence of pain †.

The membranes not only assist labour, when entire, by making the uterus contract round a larger body, and by aiding the dilatation of the os uteri, by their protrusion, but

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* During a pain, we can introduce the finger easily within the os uteri, unless the presenting part of the child prevent us. But when we attempt to introduce the hand into the uterus, in order to turn, in the intervals betwixt the pains, we find some difficulty, from the contraction of the os uteri. But whenever the paroxysm begins, we can easily introduce the hand beyond it. When the hand is fairly in the uterus, we frequently think, that, during a pain, we feel the os uteri contract round the arm; but it is a mistake. It is only the lower part of the uterus, or its distended cervix, which is thus contracting more than the rest, with a view to make the greater impression on the head, and push it farther down. The fundus, I believe, contracts most at first, to push the child farther down; but, afterwards, the lower part seems to act rather more than the upper, in order to produce a greater effect on the head.

† Until the membranes burst, there is seldom any absolute necessity for examination; because the presentation may be better ascertained immediately after the discharge, and may then be easily enough changed, if it be requisite; but if the accoucheur be inclined to examine, he ought to do it during the interval of pain, when the membranes are not tense, otherwise he will rupture them. Even after they burst, all examination, in order to ascertain the presentation, will be best made during the relaxation of the uterus, unless the part be so far out of our reach, as to require the action of the uterus to push it down to our finger. But it is always necessary to examine during a pain, when we wish to determine how far the child has advanced into the pelvis, or to what degree the os uteri has dilated.

If we are longer in feeling the presentation, than we ought to be in a natural labour, we may suspect, that either the breech, or some other part than the head, presents.

also by their preventing the head of the child from engaging too soon in the pelvis. Were the head to descend too early, it might fix the lower part of the uterus betwixt itself, and the sides of the pelvis, and thus retard the effect which the contraction of the fundus and body should have on the os uteri. In this case, the portion so fixed would have become the part acted on, instead of the os uteri. Soon after labour begins, the membranes burst, and discharge the waters. In consequence of this, the bulk of the uterus is suddenly diminished, and its action is suspended for a little; but presently returns stronger than ever; the os uteri yields more quickly, and approaches nearer to the vulva *; the head descends lower into the pelvis, and finally is expelled, the rest of the child speedily following it; the placenta is next, after a short interval, delivered, and the empty uterus slowly contracts, in a few weeks, to its original size, shape, and firmness: this return is attended with a discharge of fluid, called lochia, at first copious and bloody, but afterwards gradually growing paler, and less in quantity, until it disappears entirely.

Here it may be proper to make some observations:

First, After labour begins, the uterus is always firm, and in a state of contraction. By introducing the hand we feel it smooth and even, and exactly like the diaphragm, rendered tense. When we wish to turn the child, therefore, we will find it of advantage to run the hand up along the surface of the uterus, which, from its smoothness and tension, shall make our progress much easier, than if we bored up through the extremities of the child, or along its trunk.

Second, This permanent action of the uterus makes a constant pressure on the child, and keeps it in its situation. It embraces the hand firmly, when we have it introduced

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* This descent of the uterus is of much importance; because the vagina is thus greatly shortened, and, therefore, can more readily admit of dilatation.

in the intervals of the pain; but the force it exerts is trifling, when compared to the action of the uterus during its contracting paroxysm or pain. No one who has not tried to turn a child, can believe how great the pressure is, or how often the hand is cramped by it.

Third, When the contracting action of the uterus is feeble, the labour is very slow; but unless flooding, or some other dangerous symptom supervene, we ought not to interfere with our hand, as the power of the uterus will, in the end, be sufficient to perform its office. We know this to be the cause of a tedious labour, by the little effect produced upon the os uteri, by the slightness of the pains, and the long intervals betwixt them, and by the absence of other retarding causes, such as a narrow pelvis.

In this case, if the woman be fatigued, and not likely to sleep naturally, we may administer an opiate, which, by suspending for a time the action of the uterus, will quicken it afterwards; for every temporary cessation, in general, produces a subsequent increase of action.

Fourth, The uterus, like other muscles, is subject to irregular or spasmodic actions of its fibres, either before or during labour. Not unfrequently, these occur in the end of the ninth month, and, by the pain which attends them, alarm the woman, or make her believe that labour has begun, although it be still distant. This is distinguished by the continuance of the pain, or its irregular return, at very short intervals; by its confinement to a particular part of the uterus, or shifting about; and by its producing no effect upon the os uteri. This affection is to be removed by warm fomentations, anodyne draughts, or clysters with laudanum *.

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* After the child is delivered, these spasms of the uterus are sometimes productive of considerable pain, and occasionally prevent the expulsion of the placenta, until they are slowly overcome by the introduction of the hand.

Fifth, If the contraction of the uterus be in due degree, but unable to force down the head, owing to the smallness of the pelvis, we must increase the force, by fixing the forceps, or the lever, on the head, and thus extract what the unassisted powers of the uterus could not expel. If this be impossible, from the very contracted size of the pelvis, we must diminish the bulk of the head with a pen-knife, or a pair of scissars, and then extract either with the forceps or crotchet. The same direction holds good, when a feeble action of the uterus is conjoined with the deformity of the pelvis. Although this be an established rule, and the practitioner be fully warranted to employ instruments, whenever the diameter of the pelvis is too small to permit of natural delivery; yet it is too certain, that not a few believe their application to be necessary, when it really is not. Were this not the case, why should we so frequently hear the man of discernment praised, for delivering a woman without instruments, of a living child, who had often been formerly delivered by others of dead children, by the forceps or crotchet? No one, who has not seen it, could believe how much the bones of the cranium will overlap each other, in a tedious labour. By this mean, the power of the uterus is often sufficient to expel a child through a very small pelvis. This needless application of instruments, may be excused in some, upon the supposition of ignorance; whilst others, from reasonings and principles, may believe it to be proper. But there are others sufficiently unprincipled to have recourse to the forceps or lever, whenever the woman is not delivered within a certain number of hours after they are called. This is a practice for which there can be no apology offered, and for which, I might add, no professional censure can be admitted as an adequate punishment; because the application of instruments, in most hands, and in every hand, at certain times, is attended with pain to the woman, and danger to the child.

Sixth, After the child is delivered, the action of the uterus sometimes ceases, for a considerable time, and the placenta remains longer than it should do. But if no flooding takes place, this is of little consequence, as, sooner or later, the presence of the placenta renews the contraction of the uterus, and procures its own expulsion.

Seventh, This atony of the uterus may cause hemorrhage, by allowing the vessels to remain open, the fibres not contracting around them. This may happen either before the placenta comes away, or even many hours after it is delivered; and the torpor of the uterus is sometimes so great, that, when the blood is prevented from getting out, by coagula stopping up the mouth, the uterus has been known to distend, with effused blood, to a very great degree. The same effect may happen, when the mouth contracts, but the fundus and body of the uterus remain torpid. This occasionally occurs; for one part of the womb may contract more strongly than another. This state of the uterus is to be removed, by introducing the hand into its cavity, and thus mechanically exciting its action, whilst we make pressure on it externally. When this fails, cold applications, or the introduction of a pledget, or the hand dipt in vinegar, brandy, or solution of alum, may be useful and allowable.

Eighth, When we can feel the uterus through the abdomen, or from the vagina, not yet quite contracted; when the orifice is thick, soft, and readily admits the finger; and when there is a greater secretion than usual from the part, we may pronounce, that the woman has been recently delivered; and our judgment will be confirmed, by observing the fulness of the labia, and the state of the breasts.

Having taken notice of the natural accession of the action of the uterine fibres, at the full time, it may be proper next to mention, that they are susceptible of action not only at the end of the ninth month, but also during any of the earlier periods. This may be induced in five ways *.

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* It may, by some, be thought improper to mention particularly the methods of inducing abortion; but this is not a book which will likely

First, By sympathy. The connexion betwixt the uterus and fœtus is so intimate, that a disease of the uterus, or of the membranes, will destroy the child; whilst the death of the child will very commonly prevent the farther increase of the uterus. Whenever the uterus ceases to enlarge, it begins to contract. The one condition regularly succeeds to the other; from whence we may understand, how an affection of the contents of the womb may induce its premature contraction. But, besides this sympathy with its contents, its connexion with other organs may produce contraction of the uterine fibres. Thus, for instance, violent affections of the intestines, induced either by disease, or intentionally by purgatives *, frequently occasion abortion. Emetics, by their effects on the stomach, and partly by mechanical concussion, may produce the same effect. Violent passions, by their influence on the brain, are also causes, acting by sympathy.

Second, By mechanical irritation. Emetics and purgatives act in this way, as well as by sympathy. Blows and falls are likewise to be referred to this head, although they may sometimes operate solely by producing a separation of the membranes †. Introducing the finger a little way with-

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fall into the hands of any but medical readers, and it is proper that they ought to be apprised of the exciting causes of abortion.

* Aloes, colocynth, and drastic purges, are too frequently employed for this purpose, by unfortunate and unhappy females. But abortion, procured thus, is much more dangerous, than that which takes place from some other causes; because the very violent action of the means employed, adds considerably to the injury of the system. It is, on this account, a common observation, that abortion, which takes place without the wish of the woman, is much less dangerous than that which she voluntarily induces.

† A separation of the membranes uniformly takes place in abortion. Sometimes, as we see in the effects of falls, &c. it becomes the immediate exciter of the miscarriage, and precedes the contraction of the uterus. At other times, it is only a necessary effect of the contraction or aborting action of the womb. This is exemplified in the abortion induced by purgatives.

in the os uteri, and irritating the part, by gentle but long continued motion, is, however, one of the best examples of the effects of mechanical irritation.

Third, By suddenly diminishing the volume of the uterus, and thus producing an artificial contraction. By piercing the membranes, either with the finger or a trocar, we let out the waters, and produce a collapse of the uterus. This, in the course of a few hours, though sometimes not until after several days, excites the action of the uterine fibres *.

Fourth, By general affections, or diseases of the system. Any febrile action of the system may occasionally induce abortion: but such as are accompanied with an eruption on the skin, are particularly apt to affect the uterus. Thus, for instance, a very great proportion of negroes in the West-Indies, who take the small-pox when pregnant, miscarry; and, I believe, we may likewise say, that most women, who are affected with syphilis to a great degree, or for a long time, abort. Typhus fever, on the contrary, though assuredly a very violent action, more seldom affects pregnancy. In such as have died of this disease during gestation, I have found the uterus and fœtus perfectly sound; and, in those who recovered, I have not often known the pregnancy affected, or the fœtus in the least injured †.

Fifth, The uterus may expand too soon in its different parts, and arrive earlier than the ninth month at the same situation in which we find it naturally at the full time. This depends upon unknown causes, over which we have no control. It sometimes appears to be induced by pre-

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[*] As neither this, nor any of the other causes of abortion, operate, generally speaking, immediately, we cannot be certain, for some days, that blows, diarrhœa, &c. in pregnant women, have done no harm.

[†] Infants appear to be much less susceptible of typhus fever than adults; and the fœtus in utero seems to be still less capable of being acted on by the contagion. It is, however, possible for the child to receive this and other diseases before birth. When this happens, they generally, if not uniformly, die, and labour supervenes.

vious abortion, which gives this morbid disposition to the womb. Although the uterus seems to arrive at the full distention prematurely, yet the vascular membranes are sometimes found in the same state, both of thickness and distention, as in other cases, at the same period. They have not enlarged or extended in proportion to the expansion of the uterus; and, therefore, the distention of the cervix uteri must be attended with hemorrhage, owing to the separation of the decidua, which necessarily takes place. In this case, I have known a bleeding continue for weeks, until labour took place, in the seventh month. Our interference or delay must be regulated by the hemorrhage, and its effects on the constitution.

Upon this subject it may not be improper to make some farther observations, of a practical nature:

First, In abortion, by which I mean the expulsion of the child in the early months, the larger that the body to be expelled is, the more powerfully and effectually does the uterus contract. Hence we ought never, in the first three or four months, to pierce the membranes, in hopes of accelerating the expulsion; for the very reverse happens. The waters run out; the fœtus, after a continuation of the bleeding, at last escapes; but the placenta and membranes remain. But, from the diminution of bulk, the uterus cannot expel them so soon, as if we had not interfered. The disease is, therefore, longer protracted, and more blood is lost, and a greater injury done to the system, than if the woman had been let alone. It is true, that frequently the membranes burst early in abortion, without any assistance; but these cases are by no means so favourable, as those in which this does not take place; and no argument in favour of the practice can be drawn from them. In the later months of pregnancy, however, the case is different; for then the quantity of blood effused is sometimes such, as to make it necessary to produce a diminished size of the uterus and its vessels. At this time, the size of the fœtus keeps up the action of the uterus, after the escape of the waters, and excites its own expulsion.

Second, The less of the cervix that is distended, the longer is the ovum in being expelled, and the greater is the difficulty of giving manual assistance. At the full time, the only part which remains to be dilated, is the os uteri; but earlier, the undistended cervix opposes an additional resistance. Until about the sixth month, when three-fourths of the cervix is distended, it is impossible to dilate the parts with the finger, in order to extract the child; and, luckily, at an earlier period, this is not necessary.

Third, When the pelvis is so small, that a child, at the full time, cannot pass through it alive, it has been proposed to induce premature labour, about the seventh month, when the child was smaller. But this is an operation which is very seldom advised, until, by the experience of a former labour, it has been demonstrated, that the woman could not be delivered without the crotchet, or lessening the head of the child. When this is ascertained, the practice is most undoubtedly proper, and ought always to be had recourse to; because it is in itself safe, with regard to the mother, and gives a chance of life to the child *, who must be inevitably destroyed, if the head be lessened, or the crotchet applied. When we have agreed to perform this operation, we may employ the mechanical irritation of the os uteri. If this be not sufficient, the puncture of the membranes always will produce the effect.

Fourth, The expulsion of the child, in the early months, from whatever cause it takes place, is uniformly attended with a discharge of blood; but, in advanced pregnancy, there is no flooding †, unless the uterine action be excited by such causes as produce a separation of the placenta, or

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* The Marechal Duc de Richelieu was born in the sixth month of pregnancy.

† Every delivery is preceded or attended by a discharge of blood; and this discharge must inevitably be greater in quantity in the sixth or seventh month, than in the ninth, owing to the greater thickness and vascularity of the decidua: but this discharge cannot be called a flooding.

membranes; or, in the case already mentioned, where the extension of the uterus and membranes do not correspond.

Fifth, During abortion, pain is a desirable occurrence; because it shows that the uterus is contracting, and promises a more speedy expulsion.

Sixth, After the uterine contraction has once fairly begun, it can seldom, if ever, be stopt. One French author, indeed, relates three cases, where labour began before the ninth month, and proceeded so far, as to dilate the os uteri to the breadth of half-a-crown. By bleeding, in the first case, in which plethora was the reputed cause of labour; by giving a good diet, in the second, which depended on abstinence; and by administering an injection, in the third, which depended on costiveness, the os uteri closed, and the woman went to her full time. Of the accuracy of these cases, every one will form his own opinion. It may likewise be thought to be an objection to this axiom, that a woman, after being threatened with abortion in the early periods, and losing much blood, yet sometimes retains the child. But there is a great difference betwixt a flow of blood from the uterus, and a contraction of its fibres. In these cases, the uterine action has not commenced; a portion of the decidua has only been detached.

The pathology of the uterine muscular fibres may now be finished, by taking notice of their rupture. The uterus, like every other muscle, may not only be lacerated by external violence, but also may be torn by its own action. As long as the membranes remain entire, the uterus contracts round an even surface, and all its efforts are directed to dilate its mouth. But when the membranes burst, the uterus must then contract round the unequal surface of the child's body, and may be torn over some projecting portion. This, however, is seldom the cause of the rupture. More frequently it proceeds from a narrow pelvis, in which the head of the child gets so jammed, that it intercepts, very completely, a portion of the uterus betwixt it and the projecting or deformed part of the pelvis. Against this portion of the uterus, then, and not against its mouth, is the contracting force of the uterus directed. In this case, very great pain is felt in the intercepted portion on which the uterus is acting, which increases, until it suddenly is rent, and the child escapes through it into the abdomen; or, in some rare cases, the same pain which tore the uterus, has been able to push the head beyond the projecting part of the pelvis, and delivery has taken place in the natural way.

When, in a tedious labour, the woman complains, during each contraction, of severe pain, referable to a particular spot, suddenly increasing to a violent and excruciating degree, and followed instantly by a discharge of blood, we may suspect this event to have taken place. If to this succeed nausea, vomiting, faintishness, cold sweat, and feeble pulse, we may be still more convinced of it. But a rupture must have happened, beyond a doubt, if the labour pains cease entirely, and the presenting part of the child recedes or disappears, whilst, by pressure externally, we can feel an irregular body in the cavity of the abdomen.

This is a most alarming and dangerous accident; but the practice is plain and simple. We must immediately introduce the hand, and lay hold of the feet of the child, if they be still in the uterus. If they be not, we must pass the hand through the rupture, and search for them, delivering steadily, but not hastily, taking care that none of the intestines follow through the rent. If this cannot be done, we must make an incision through the abdominal coverings, and remove the child, which is indeed a very terrible and dangerous operation, but not more terrible or more dangerous than the Cæsarean section.

Upon this subject, I shall make two additional remarks:

First, In a woman with a narrow pelvis, we ought to be more cautious than ever of rupturing the membranes, and thus allowing the head to engage too soon in the cavity of the pelvis. We ought likewise to attend to the axis of the uterus, which, if too oblique, might make its side be easier caught between the head of the child, and the projection of the sacrum.

Second, After the membranes have burst, if the pain continues violent, but the head makes little progress in its descent, and especially if more pain be felt in the back, at the projection of the sacrum, or in one part of the uterus than in the rest, marking the production of a greater effect of the contraction in that part, we must assist delivery, by turning, if the head can be pushed back, or by the forceps, or even by lessening the head, if it be too high up to admit of the application of safer means. We are fully justified in doing so, when we consider how very dangerous the accident is, which we apprehend and mean to prevent.

Before quitting this subject altogether, I may take notice of a very dreadful disease, which affects the fibres in common with the rest of the substance of the uterus; I mean the inflammation of the womb after delivery, or what is commonly called the puerperal fever.

This disease generally makes its appearance soon after delivery, and is marked by shivering, frequent pulse, great thirst, followed by excruciating pain in the lower part of the belly, spreading soon over the whole abdomen, which swells, and becomes very tender. This is uniformly attended with vomiting of bilious and dark-coloured matter, and not unfrequently with a dysenteric affection of the bowels. From the first, the lochial discharge is suppressed, and the secretion of milk stops.

If the disease be not checked, it very soon ends in gangrene; the pulse sinks, the teeth collect a sordes, singultus supervenes, the pain goes off, and the patient dies in cold sweats and delirium.

Whenever this disease approaches, the lancet must be had recourse to, and the stomach emptied, by drinking an infusion of camomile, with a few grains of ipecacuanha diffused in it. The common saline julep, sweetened with manna, may then be prescribed, with the addition of small doses of tartar emetic. The belly is likewise to be fomented with flannel cloths, wrung out of warm water, having laudanum sprinkled on them; or, if the pain continues violent, a blister may be applied.

After the more immediate violence of the disease is overcome, opiates, conjoined with antimonials, may be advantageously administered, and the belly kept open, by small doses of calomel, made into pills, with the extract of hyocyamus *.

The diminution of the pain, the cessation of the vomiting, and the abatement of the thirst and frequency of pulse, are favourable signs. When the lochial discharge, and secretion of milk return, we may pronounce the woman well.

Of the Ligaments of the Uterus, Fallopian Tubes, and Ovaria.

No one who understands the anatomy of the ligaments of the unimpregnated uterus, will be surprised to find a great change produced in their situation and direction, by pregnancy.

The broad ligament, which is just an extension of the peritoneum from the sides of the uterus, is, in the ninth month, by the increase of that viscus, spread completely over its surface; and, therefore, were we to search for this ligament, we should be disappointed. Its duplicatures are all separated, and laid smoothly over the uterus. It will, therefore, be evident, that we can no longer find the ovaria and Fallopian tubes floating loose in the pelvis, nor the round ligaments running out at an angle from the fundus uteri to the groin. All these are contained within duplicatures of the peritoneum, or ligamentum latum; and, therefore, when this is spread over the uterus, it follows, that the ovaria, tubes, and round ligaments, cannot now run out loosely from the uterus, but must be laid flat upon its surface, and bound down by the stretched peritoneum*.

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* I have uniformly employed these pills with success in dysenteric affections, and never knew them once fail, when administered early in the disease.

The Fallopian tubes, then, are to be found running down, clinging to the sides of the uterus, with their fimbriæ spread out upon its surface. These fimbriæ are larger, thicker, and more distinct than formerly, and the tubes are softer and more vascular. A pretty large probe may be passed along them, until it comes to about an inch and a half, or two inches, from the uterus, where it is stopped by the decidua.

The round ligaments, like the tubes, run down close by the side of the uterus, and are thicker, rounder, and softer than formerly. They are likewise so vascular, that they seem to consist of nothing but vessels, and may readily be made turgid, by injecting size from the hypogastric arteries. From their great vascularity, and from their terminating in the groin, some have supposed, that their use was to keep up a free circulation betwixt the external and internal parts. But for this there seems to be no great foundation.

Behind the fimbriæ lie the ovaria, which are not much enlarged, but are more vascular; the vessels running round them, and dipping down into their substance. After each pregnancy, we may perceive, in one or other of them, a yellowish spot, called corpus luteum.

By making a section of the ovarium, in such a direction as to take in the corpus luteum, we find it to be a round body, of a yellowish colour externally, but white in the centre. This centre, in the early months, is hollow, and contains a fluid: it may likewise be easily filled with size, by fixing a pipe in the spermatic artery. On the surface of the corpus luteum, we find a small depression or pit; but it has never been seen to communicate with the cavity, although it is probable that it does so immediately after conception. The vessels of the ovarium are every where numerous; but they are, at this spot, so plentiful, and, at the same time, so superficial, that, at a distance, we would imagine that the corpus luteum was covered or surrounded by an extravasation.

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* This description applies only to the state of the uterus at the full time. Earlier, we may readily observe the broad ligament flying out, and allowing the ovaria free play.

The ovarium was once supposed to secrete a female semen, and, therefore, was called the testicle of the woman. This is now disproved; but still there can be little doubt that it deserves to be considered as a gland. Some, perhaps, may cavil, when I say, that it is here that the rudiments of the fœtus are secreted; but the cavil can only be at the use of a word. The male semen is the natural stimulus to this gland, which excites it to action; but other stimuli will induce an imperfect action in it, similar to that of generation. It is, for instance, a fact, that confused masses, consisting of flesh, bones, and hair, have been found in the ovaria of women, who had all the signs of virginity.

Like other secreting glands, the ovaria may be affected with true schirrhus and cancerous ulceration: but it differs from all the rest, in being subject to a dropsical effusion of water within its substance. The sac or cavity so formed, has sometimes a smooth surface internally, but oftener it is rough and pointed. In some cases, I have seen it studded over with large projections, making it resemble the gravid uterus of the cow, with its papillæ. This disease is not confined to the human species, but affects birds and quadrupeds also.

It is said, that sometimes the fœtus does not pass from the ovarium into the tube, but is retained in that gland, in which it grows to a certain size. This may sometimes happen, though very seldom, the embryo remaining in the cavity of the corpus luteum; but it never can arrive at any great size in the ovarium. Oftener, the embryo reaches the surface of the corpus luteum; but, not being received by the tube, either attaches itself to the external surface of the ovarium, or to some of the abdominal viscera. Even this, however, though more common than the former species of extra-uterine pregnancy, is so rarely met with, that it is recorded by authors, rather to prove the possibility of the case, than with the intention of making others expect to meet with similar instances.

The most frequent species of extra-uterine pregnancy, is that which takes place in the Fallopian tube, the embryo stopping in it during its descent. In this case, the tube performs the office of the uterus, and resembles exactly one of the uterine cells of the quadruped, both in thinness and shape. The gestation, however, can seldom be continued beyond the third or fourth month, from the inability of the tubes to extend any farther.

If these fœtuses do not die, at a very early period, pain uniformly takes place, whenever the tube ceases to distend; and this is supposed to mark an attempt at expulsion. In consequence of this action, a degree of inflammation commences, which unites the cell or distended tube to the neighbouring parts. Suppuration next takes place, and the abscess bursts, either externally, through the abdominal coverings, or into one of the intestines. By this process, the bones of the decayed fœtus are discharged with the matter, and the woman recovers, after suffering much pain, and having her health greatly impaired.

Sometimes, after a short continuance of pain, the woman becomes free from farther uneasiness, part of the fœtus being absorbed, and the rest remaining, like a confused mass, within the thickened tube.

It has been proposed to remove these fœtuses, by making an incision through the skin and muscles into the tube: But, unless the primary symptoms were very violent, and threatened immediate mischief, this practice is neither necessary nor allowable. In the subsequent stages, it is, I apprehend, uniformly inadmissible. From the changes which take place in the child, owing to its retention, and from the alterations induced in the tube, by the irritation of the fœtus, we cannot expect, in the first place, to extract the whole of the embryo at once; and from the diseased state of the parts, we cannot, in the second place, expect a cure, without a great inflammation, and a very long continued suppuration, which surely are not very likely means of counteracting these effects, for the removal of which the operation was proposed. Making a superficial puncture or incision into the abscess of the tube, when it points externally, is a very different practice from this, and is not liable to any of these objections.

The only certain mark of these extra-uterine pregnancies, is feeling the motion of the child, whilst we find the uterus and its neck not exactly the same which it ought to be in a common pregnancy.* But it is not always that this motion can be perceived; and, therefore, there is often a great degree of uncertainty with regard to the nature of these tumors. The symptoms of schirrhus, or dropsy of the ovarium, are, it is true, frequently so well marked, especially after these diseases have continued for some time, as to prevent any uncertainty with regard to the nature of these tumors. But, at other times, the history and appearances are so confused and unsatisfactory, that three men, equally eminent, shall each deliver a different opinion.†

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* In almost every instance of extra-uterine pregnancy, the uterus does enlarge a little, which may contribute to assist the diagnosis, distinguishing the disease from schirrhus or dropsy of the ovarium. From the swelling of the tube, the uterus is also frequently elevated, and the vagina elongated.

Sometimes, though rarely, the enlargement of the uterus, in the commencement of extra-uterine conceptions, is as great as it would have been in a natural pregnancy of the same period.

† In forming a judgment of these tumors, we are to attend to the state of the woman with regard to menstruation, and to the feeling of the tumor, whether it be hard or soft, or fluctuates; to the degree of pain, and whether it came originally in paroxysms; to the progress which the tumor has made in a given time, and to the effects which it has produced on the neighbouring parts, and on the constitution. The state of the uterus ought also to be attended to; because the condition of the neck and other parts will assist the first part of our inquiry, which is to determine, whether the woman has conceived. The con-

Of the Blood-Veſsels, Nerves, and Lymphatics of the Uterus.

The uterus is very plentifully supplied with blood, and the vessels are numerous; but a sufficient knowledge of the vascular system of this organ may easily be obtained and recollected, by observing, that the blood is sent chiefly by two arteries, the hypogastric and spermatic. The first of these supplies the lower, and the second the upper part of the uterus; and both of them have this general plan in their distribution, that they send off branches, in three directions, upward, downward, and laterally.

The hypogastric artery of the uterus, which is the largest of the two, meets this viscus near its cervix, and sends off branches immediately to encircle it: but the principal branches go off in two directions, the one downward, along the sides of the vagina, the other upward, by the sides of the uterus, spreading out, especially in its fore part, and anastomosing with the descending branches of the spermatic artery.

The spermatic artery, at the full time, meets the uterus rather below its middle; it directs its main course upward, but sends very considerable branches down to join with the hypogastric. Its lateral branches run obliquely upward, whilst its ascending branches, which may be considered as the continuation of the trunk, supply the fundus uteri, the ovaria, and the ligaments. There are, then, three facts to be remembered in the vascular history of the uterus.

First, The hypogastric artery supplies directly the mouth and neck of the uterus, and the upper part of the vagina.

Second, The spermatic artery supplies directly the fundus uteri and the ovaria.

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dition of the womb not corresponding to that which it ought to have been in the same period, in a natural pregnancy, will prove that the pregnancy is extra-uterine.

Third, The descending anastomosing branches of the one artery, and the ascending branches of the other, supply, by their ramification, all the body of the uterus.

The veins follow the same general course with the arteries, and both are largest and most numerous where the placenta is attached. We ought, therefore, in the Cæsarean operation, not to cut near the fundus, but about the middle of the body of the uterus, and on its fore part: but, wherever we cut, we must expect a very sudden and great loss of blood; because the arteries, in many places, are equal to that of the wrist, and the veins are as large as those of the arm.

These veins anastomose much more freely than in other parts of the body, and are completely destitute of valves; so that by fixing a pipe in one of them, the whole may be injected. From their magnitude, they have been called the uterine sinuses.

The blood vessels of the uterus form together one general and extensive plexus, and plunge, by branches of different sizes, down into its substance, and through into the placenta and decidua.

Anatomists have been very busy examining the nerves of the uterus, idly hoping thus to explain the sympathies which take place. But it is quite sufficient to mention, that the uterine nerves arise from the intercostals, and follow the same course with the vessels. They are, therefore, distinguishable into a spermatic and hypogastric plexus. Their branches have been said to be somewhat enlarged during gestation; but this enlargement is so small, that its reality may be questioned *. I rather imagine, that pregnancy

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* We know, that although the nervous substance be capable of increasing itself, yet, unless the nerve be divided or wounded, it seldom does so. In diseased joints, and other swellings, I cannot say that ever I have found the nerves enlarged, though frequently the vessels were very much increased in diameter.

only allows us to trace them more easily, from the softness and distention of the uterus.

Lymphatic vessels have been often observed in the uterus of brutes, by Rudbeck, Malpighi, and Haller, and have been found on the surface of the human uterus by Mery, Morgagni, and many others. Every part of the uterus, and its appendages, is covered with these vessels; but it is only in the gravid state that they are easily detected. Before impregnation, they are exceedingly small; but, in the end of gestation, many of the trunks are equal to the size of the barrel of a goose-quill. The branches are likewise so numerous, and so large, that when they are well injected, we would, as Mr. Cruikshanks observes, believe the uterus to consist of lymphatics alone.

These vessels have been observed entering into the placenta; or, at least, opening on the inner surface of the uterus.

The lymphatics of the upper part of the uterus, and all those from the ovaria, run along with the spermatic vessels, terminating in glands, placed by the side of the lumbar vertebræ. Hence, in diseases of the ovaria, there may be both pain and swelling of these glands.

But the greatest number of the uterine lymphatics run along with the hypogastric artery, several of them passing to the iliac and sacral plexus of glands, and some accompanying the round ligament. This may explain why, in certain conditions of the uterus, the inguinal glands swell and inflame. Others run down through the glands of the vagina; and hence in cancer, and other diseases of the uterus, we often feel these glands hard and swelled, sometimes to such a degree, as almost to close up the vagina completely.

Of some of the Mechanical nd Sympathetic Effects which the Gravid Uterus produces on other Parts of the System.

Whatever tends to impede the circulation of the blood, in any very large vessel, must affect the action of some other part of the vascular system. To be convinced of this, we have only to attend to those terrible consequences produced by strictures of the aorta, or to those fatal affections of the brain, which sometimes take place in elderly people, after the amputation of the thigh, or the ligature of any great artery.

It has often been maintained, that, towards the end of gestation, one or both of the internal iliac arteries might be compressed;* and there are not wanting many histories, which have been recorded with a view to prove that this pressure has produced apoplexy, bleeding from the nose, hæmoptœ, or hemorrhages from the bowels. It is, however, very much to be doubted, whether these cases occur so frequently as some suppose. It is most certainly an erroneous principle, to ascribe these effects, in every instance, to the same cause; or to say, that because, in one case, the insensibility or the bleeding continued until labour was brought on; therefore, in every other case of the same disease occurring during pregnancy, the same cause, and a similar treatment, must be allowed. Women, when pregnant are undoubtedly subject to apoplexies, to violent hemorrhages, and to every other disease to which they are liable at other times; but it is unphilosophical to attribute these diseases to the accidental circumstance of pregnancy. The great vessels are not very apt to be compressed by the gravid uterus; and it is still less likely, that both iliacs should be affected at the same time. But, even granting the gravid uterus, in every instance, to press, in a greater or less degree, upon one of the great vessels, it does not follow, that any bad consequences should uniformly result from this. Those who are conversant in surgical operations, must know how great the force is which is required to stop the flow of blood through a large artery; and whoever attends to the relative situation of the uterus and vessels, and the weight of the uterus, must admit, that the cause assigned is very inadequate to produce the supposed effect.*

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* There is no doubt that the soft sides of the uterus, distended with water, often press on these vessels; but the pressure is very slight, the uterus yielding, and forming a groove or channel in which the vessels run.

Some may consider it as a matter of little consequence, whether we admit the pressure of the uterus, to be a frequent cause of hemorrhage or not; but they are mistaken: because those who maintain this opinion, will naturally, whenever they fail to check the disease by the common remedies, have recourse to delivery, by which, in almost every instance, they can only add to the danger.

But, although I have said that the pressure of the gravid uterus upon the arteries, can seldom be sufficient to produce any bad consequences, it may yet be able to affect the veins and lymphatics; for these require much less force, and more trifling causes, to impede their action. It is in this way, that we are to account for the varices and the œdema of the legs, so frequent in some women, and which continue, in spite of every remedy, until after delivery.

By a similar pressure upon the nerves, we are to account for those cramps, and feelings of numbness in the thighs, which are occasionally felt during gestation; and for that alternate coldness and glow of heat, which pregnant women sometimes complain of in the inferior extremities. This pressure may likewise affect the nerves at their origin, and make the woman believe that she is in labour *.

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* Although I have denied that this effect is commonly produced, I do not maintain that it never happens. On the contrary, I have seen both a spitting of blood, an epistaxis, and giddiness of the head, decidedly produced by pregnancy; but I never found it necessary to interpose.

The effect of the uterus upon the bladder and rectum, during gestation, has been already noticed; but these organs, especially the bladder, may be affected in a greater degree, during parturition. From the union and connexion subsisting betwixt the uterus and bladder, we occasionally find the bladder protruded, during labour, by the pressure of the uterus. This might, at first, be taken for the membranes; but a little attention, soon discovers that the tumor does not arise from the os uteri. Little can be done, except emptying the bladder, and pushing it back, during the intervals of pain. During the end of pregnancy, the bladder is sometimes pushed lower down than usual, and, when empty, gives a very curious feeling to the finger, resembling somewhat the soft mouth of the uterus after delivery, the middle yielding a little before the finger, and the sides projecting over it; but its vicinity to the pubes, must prevent any mistake, even with the youngest student.

Besides these effects, there are others produced by the uterus on distant parts, by means of that sympathetic connexion, which so evidently prevails in every part of the animal body.

During menstruation, the derangement of the stomach or intestines, and the various affections of different parts of the system, called hysteric, point out this association. With the stomach, there is a very intimate union, in so much, that in many women, the action of menstruation affects that organ to a very great degree; and, in almost all women, the commencement of pregnancy is marked, not only by vomiting

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* When this pressure produces much pain, during labour, either in the extremities or the belly, it has been proposed, to diminish the size of the uterus, by piercing the membranes; but I should suppose that this would have very little effect. The disease itself can very rarely occur; because, when the uterus is tense during labour, the nerves are out of the way of pressure.

in the morning, but also by more or less of a permanent dyspepsia. With the mammæ, the sympathy is, if possible, still stronger; for, when gestation begins, these begin to enlarge; and when it ends, their secreting action immediately appears. But the most dangerous sympathetic affection, is that, subsisting betwixt the uterus and the brain, producing those dreadful convulsions, which sometimes attend labour. These convulsions, or epileptic attacks, seem, in many cases, to depend on the very irritable state of the uterus in labour, which affects the brain much in the same way with wounds, and other irritations of the nerves.

They are often preceded by giddiness, slight raving, and violent pains of the head, aggravated during each pain, and not unfrequently by spasmodic affections of particular parts; especially the stomach. In these circumstances, bleeding from the temples, cold air, and sometimes anodynes, may prevent the accession of any epileptic paroxysm. But, occasionally, in spite of every preventive, they do supervene, either during labour, or after the expulsion of the child. When they occur during labour, delivery is certainly a desirable event. But were we, in the beginning of labour, to increase the irritation, by forcible attemps to dilate the os uteri, we should certainly do hurt. If, however, the labour be so far advanced, as to enable us to deliver easily, we may do it; because we thus have the chance of getting sooner rid of the irritation, although, by our interference, we give a temporary increase to it. It is at the same time disagreeable to know, that this will not always abate or remove these affections. The retention of the placenta, and clots of blood, or even the contracting condition of the uterus, which necessarily continues for some time after labour, is often sufficient to keep them up; or, in some cases, to induce them, although they formerly were not present.

Delivery, then, is, in the beginning of labour, improper; and even when it is farther advanced, is very uncertain in the relief which it affords. Still, in this period, the practice is not to be forgotten, when we can do it without any material increase to the irritation, and when the other remedies have failed.

There is another sympathetic affection, which is by no means uncommon, and which is exceedingly troublesome; I mean that swelling of the thigh and leg, to which some women are subject, after delivery.

This appears sometimes a few days, but oftener a week or two, after delivery, and begins, without any evident cause, with a pain and tension in one of the groins. This is speedily followed by a colourless swelling of the integuments, gradually extending down the thigh and leg, which become stiff, and extremely painful. At the same time, the pulse quickens, the thirst increases, and a fever supervenes, which bears more resemblance to the hectic, than to any other species. At first, the patient is generally costive, but afterwards a diarrhœa is not uncommon. During this disease, the lochial discharge, and the secretion of milk, are not necessarily affected.

This swelling is not œdematous, for it does not pit upon pressure, at least without considerable force, nor is water evacuated by a puncture. When it has continued for some time, it is not uncommon for the glands, at the knee and groin, to swell, and become painful.

After a few weeks, the disease generally subsides, the fever diminishes, the appetite returns, and the patient gets well.

We are not yet well acquainted with the cause of this disease; but I do not see that we can account for it mechanically, upon the supposition of pressure: for it occurs at a time, when the effects of pressure ought to be least *. I am more disposed to consider it as a sympathetic affection.

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* It may be said, that although the pressure be now removed, yet its long continuance has over-distended, and weakened the lymphatics, the effects of which now appear. But were this the case, then the disease ought to appear sooner after delivery, than it sometimes does: it ought sometimes to occur during gestation; and it ought, lastly, to take place more universally, than it does.

The treatment consists in attending upon general principles, to the affection of the constitution, and the state of the bowels, whilst, at first, we apply warm fomentations to the part affected, and afterwards employ gentle frictions, with anodyne balsam, or soap liniment. But, in many cases, the disease follows its own course, and resists, for a certain time, every application.

Of the Contents of the Gravid Uterus.

In opening a Gravid Uterus, we find a child contained in its cavity, with a vascular cord running from the navel to a particular part of the womb. Here we find it inserted into a thick flat cake or placenta, from the edges of which there goes off a membranous covering, lining the uterus every where, and investing the child. The consideration of these different parts, then, must be made connectedly, and the dependence of the one upon the other held always in view.

This mutual dependence is so great, and the history of one part implies so much knowledge of all the rest, that it is difficult to say, where a regular demonstration ought to commence. Nevertheless, I shall begin with a general account of the child; next, I shall describe the umbilical cord, or the vessels which connect it to the placenta; then, I shall examine the placenta; and, lastly, the membranes.

Of the Fœtus.

The exact time at which the embryo, with its coverings, descends through the tube into the uterus, and becomes the subject of examination, has never been exactly ascertained. Neither is its size, when it does descend, well known; but its increase afterwards is very rapid.

I have never been able to ascertain exactly the history of such women as I have inspected; and, therefore, I cannot, from my own observation, say when the embryo is first to be seen in the uterus. But it is allowed by most anatomists, that this does not happen until the end of the first month. I have observed a vesicle in the Fallopian tube, containing a turbid fluid, (similar to that which is found in the young ovum of the bitch,) when, from the state of the uterus, I was certain, that, if it was an ovum, it could not have been above a week or two old.

Although it be now generally allowed, and highly probable, that the human embryo is not visible in the uterus until the end of the first month, yet many have declared, and, I dare say, really believed, that they have seen it much sooner. Maningham says, that on the sixth day, the embryo is to be discovered in the uterus, and is as large as a grain of barley. Boehmer tells us, that, in one week, the membranes are as large as a bee, and involve a fœtus like a little worm. Puzos makes the fœtus like a bee, on the fifteenth day, and the membranes like a walnut. Whilst Everard, resolving not to be blinder than the rest, says, that, on the seventeenth day, (although how he is so certain of the date he does not tell us,) he saw a little human being, with its extremities formed. But this is nothing, when compared to the discovery of Mauriceau, who, in the tenth week, saw a little creature, who moved his arms and legs, and opened and shut his mouth,—no doubt as a compliment to the observer.

For a considerable time after conception, the fœtus is soft and mucilaginous; and, therefore, must be dipped in spirit of wine before it can be examined. This alters, in some degree, its shape, producing a contraction of the parts; and, to this cause, Baron Haller attributes that distinctness and sharpness which some painters give to the embryo, and which naturally does not exist. About the seventh week, the embryo is about the size of a bee, and is still gelatinous. In the eighth week, it has been seen a little larger, and consisting of two oval masses, which are the head and trunk. The body is both a longer and broader oval than the head, which is inclined forward on that part of the body which is to become the breast. The division of the two ovals corresponds to the neck. On examining the head, we find two small dark coloured circles, which are the eyes. They are placed at a great distance from each other, and very low down, and in the centre of each is seen a white speck.

Soon after this, a small eminence is observable, corresponding to the nose, and an opening in the place of the mouth. The extremities likewise, about this time, begin to sprout out, the arms being directed obliquely upward toward the face. This embryo weighs about a scruple, whilst the membranes are as large as an egg, and weigh in proportion.

After this period, both the growth of the whole fœtus, and the developement of particular parts, proceed very rapidly. In the twelfth week, the fœtus weighs about an ounce and a half,* and measures, when stretched out, three inches. The head and features are completely formed; but the extremities, especially the inferior ones, are small in proportion to the body. The skin of the abdomen, which was open in an earlier period, is now generally, though not always, closed up, and the intestines covered.† The membranes are larger than a goose's egg, and weigh several ounces; but the proportion soon comes to be reversed, the fœtus weighing more than the placenta and membranes. In the fourth month, the fœtus is about five inches long. In the fifth month, it measures six or seven inches. By the sixth month, the fœtus is perfect in its shape and formation, measures eight or nine inches, and weighs nearly one pound troy: the membranes and placenta weigh about half a pound. In the seventh month, it has gained about three inches. In the eighth, it gains as much, or more, and weighs four or five pounds, whilst the membranes and placenta weigh only about one pound. At the full time, the fœtus weighs from five to eight pounds, and measures about two and twenty inches. The placenta weighs from a pound to a pound and a half.

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* Some say that it weighs three ounces; but they surely must have made some mistake.

† I have seen the abdomen open so late as the fourth month.

It is probable, that, at first, the embryo grows by a kind of hydatid life; but, very soon, a more perfect action takes place, and a heart is found contracting regularly. The voluntary muscles, however, do not receive their muscular action until the fourth or fifth month. The child, then, begins, for the first time, to stir, and is said to quicken or be animated.

The peculiarities of the fœtus, with regard to the circulation, the position of the testicles and ovaria, and other circumstances, cannot be properly considered at this time.

At birth, the head is found to be small in proportion to the body of the child, and the superior extremities proportionally larger than the inferior. The skin is covered with a kind of unctuous scurf, which is supposed to be produced by the cuticular excretions.

When in utero, the child assumes that posture which occupies least room. The trunk is bent forward, and the chin pushed down upon the breast; the knees are drawn up close to the belly, and the legs laid along the back part of the thighs, crossing each other; the arms are thrown into the vacant space betwixt the head and the knees. Thus we see that the fœtus forms an oval figure, of which the head makes one end, and the breech the other. One side of it is formed by the spine and back part of the head and neck, and the other by the face and contracted extremities. The long axis of this ellipsis measures about ten inches, and the short one about the half of that. In the eighth month, the long axis measures about eight inches; in the sixth, about six inches: and in the fifth, betwixt four and five. In the fourth month, it measures about three inches and a half; and in the third month, about two and a half. In the early months, however, there is no perfect oval figure formed, and these measurements are taken from the head to the breech, which afterwards form the ends of the ellipsis. The extremities are then small, and bend loosely toward the trunk.

Much attention has been paid by accoucheurs to the dimensions of the child's head, and the proportion which it bore to the different diameters of the pelvis. These measurements, however, are not of that practical consequence, which some suppose; because, although it be certain that, the dimensions of any pelvis will always continue the same, and can only permit a body of a certain magnitude to pass through it, yet we never can ascertain the exact size of the head which is to pass, because this is constantly changing as labour advances. It would, therefore, be highly improper to take the measurement of a child's head, after a natural and easy labour, and then say, that every pelvis which was too small to allow a body of this dimension to pass, must require our interference with instruments. It ought likewise to be observed, that this comparison of the size of the head, and width of the pelvis, is often, in practice, made upon wrong principles. It has been said, that the head, from the forehead to the vertex, measures so much; and that the diameter, from ear to ear, is likewise so much. This, then, has been compared to the length and breadth of the aperture of the pelvis, and a certain allowance made for the overlapping of the bones. But this calculation is wrong; because the head does not descend, with its long diameter, parallel to the brim of the pelvis. On the contrary, the vertex descends first, and the rest follows, like a cone, or rather a wedge.* The vertex ought always to be felt in the axis of the pelvis; and it is the diameter of this part which we are first to attend to. The diameter of the presenting part of the vertex, or the apex of the cone, is very small; and by continued pressure, it may be so lengthened out, and its shape so changed, that a child shall pass alive through a pelvis, the diameter of which, from pelvis to sacrum, is under three inches *. We ought, therefore, not to be rash in lessening

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* Even many of those who knew that the vertex descended first, have thought that the *anterior fontanelle* generally presented at the commencement of labour, and that the vertex did not descend until labour had advanced a certain length. But, in most cases, the vertex lies over the os uteri from the very first. If, however, the long diameter of the head should, at any time, be felt in the beginning of labour, parallel to the brim of the pelvis; that it is to say, with the anterior fontanelle in the axis of the pelvis, it seldom remains long in that position; a very

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few contractions of the uterus bring the vertex into the axis of the superior aperture, and push the chin down upon the breast. In this way, the head descends, until it has cleared the superior aperture, and reached the lower part of the pelvis. The vertex is then, partly by the situation and position of the vagina, and partly by the bones and muscles co-operating with this, like inclined planes, directed forward into the axis of the inferior aperture of the pelvis, and protrudes first. This never can fail to happen, when the vertex presents; because its projection from the neck, which is to be considered as the centre of motion, corresponds to the direction and curve of the vagina, whilst the face finds a free cavity to turn into, within the hollow of the sacrum. The vertex, then, in a natural labour, is the great point to be attended to, on the part of the child: it takes the lead in every step of the descent.

If the anterior fontanelle should present, and continue to descend first, then the labour would be very tedious, owing to the size of the descending body. But generally, in this case, the fontanelle turns out of the axis, and the face presents. Face presentations produce difficult labour, because the natural turnings cannot readily take place, the projections of the head not corresponding to the cavities of the pelvis. The bones likewise cannot so readily overlap. It is, however, seldom necessary to use art, time being sufficient for the purpose. The descent, if very tedious, may be assisted, by hooking the fingers under the chin, or introducing them into the mouth, and pulling down, whilst we endeavour to turn the vertex fully into the hollow of the sacrum.

* I grant, that these instances are rather to be wished for than expected; because, although it be proved that a child has occasionally passed alive through a pelvis only two inches and a-half in diameter, yet, in most cases where the pelvis is under three inches, the child dies. Still, as there is a possibility of life being preserved, if the diameter be not much under that dimension, it is, at all times, proper to ascertain fully what effects the action of the uterus may be capable of producing, be-

the head of a child, upon the presumption that it cannot be otherwise delivered; for it is truly astonishing to how great a degree the bones of the head may, in some instances, fold over each other, without producing death *. This

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fore we proceed to lessen the head. If, however, we find the deformity to be very great, we ought to perforate the head as soon as possible; because we thus have a greater effect produced by the uterus on the diminished cranium, whilst we can expect no advantage from delay.

Various instruments have been invented, to ascertain the exact size of the pelvis; but all of them are liable to objections. The finger is the best, and can be most safely depended upon. Early in labour, we may estimate the diameter of a pelvis, by feeling for the projection of the sacrum, and then moving forward the finger to the symphysis pubis. By repeating this, and moving the finger backward and forward, we may form a tolerable guess of the diameter; and by examining the sides of the pelvis, we may ascertain where the largest opening is; for in a deformed pelvis, one side is generally narrower than another. If the vagina permits, we may also ascertain the diameter, by introducing several fingers, and observing how many can be spread out between pubes and sacrum. My fingers scarcely cover two inches and a half; if, then, I could not freely introduce these, provided the vagina permitted, in the beginning of labour, I should not expect to deliver without perforation, unless the projection of the sacrum were turned very much to one side of the pelvis, and the other side were proportionally larger. When labour has advanced farther, we may ascertain the diameter, by examining the pelvis with the finger, at the same time that we correct our estimate, by observing the progress which the head has made, and the acuteness of the angle of the wedge which it forms.

* The bones of the head, in every labour, form a wedge; and we may judge of the narrowness of the pelvis, or the degree of compression, by the sharpness of this wedge, or the acuteness of its angle. The bones in this state, have been grossly, though aptly, compared to a "sow's back." From this compressible state of the bones, or lengthening out of the skull, the head might pass almost through any pelvis, if the fore part or line which subtends the angle of the wedge, yielded in the same degree with the parietes of the cranium. Life, however, could not be preserved under a certain diameter, even although delivery could be naturally accomplished.

depends upon the imperfect action of the brain before birth; but after delivery, when the functions of the brain manifest themselves more completely, a change of shape, or mechanical injury, infinitely less than that which happens during labour, would prove fatal. Unfortunately, however, these instances of no bad consequences resulting from pressure on the brain are not universal; for in tedious and unnatural labours, a great many children die. But still the possibility of their surviving is such, as to prevent our using such means as shall inevitably destroy them, when these can be avoided, even although we might, by having recourse to them, save the mother from considerable pain *.

In the natural position, the child lies always with its head across the pelvis, and the nates turned toward the fundus uteri. One of the sides lies toward the spine, and the other toward the navel of the mother. The sides, however, are never exactly opposite to the back bone and the navel, but to some point betwixt the side of the mother and these parts. The forehead must then be directed toward one of the sacro-iliac junctions of the pelvis, and the occiput to one of the acetabula.

Until not very long ago, it was believed, that the child sat quietly on its posteriors, until it acquired the power of moving in the fourth month, when it suddenly made a summerset, and alighted on its head. Physiologists were much puzzled to account for this, until some, wiser than the rest, thought it adviseable to inquire into the certainty of the fact, before they invented a theory to explain it. The truth is,

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* By evacuating the brain, we allow the skull to lengthen out, or the angle of the wedge to become very acute, much easier than if the brain remained, and the cranium continued entire. The woman would, therefore, be thus saved from considerable pain. The effect of opening the head is such, that frequently the labour may be finished naturally, after the perforator is employed. But occasionally we are obliged to fix the crotchet on the head, and lengthen it out still more, by the force which we can thus command in drawing it through the pelvis.

that with very few exceptions, the navel string is so inserted, that the head always belongs to the heaviest part, and falls down.

An awkward position of the child is considered as apt to produce pain to the mother, during gestation; and that it renders labour difficult, is well known. There are, however, few possible positions or presentations which will absolutely prevent labour; but, in some of them, delivery will be sooner and easier finished, by artificially turning and bringing down the feet. This is a practice which has been long followed with success, and which is frequently pointed out and followed by nature herself. In very forbidding and alarming situations, it is not unfrequently found, that the pressure of the womb acts so upon the child, as to make it turn, to a certain degree, without any assistance, after which the labour goes on smoothly.* I believe, that if we, in this respect of turning, take nature for our guide, we should save the woman much pain, and perform our operation with less danger and difficulty. In presentations of the arm or shoulder, for instance, it is an established rule, to turn and bring down the feet, pushing up the shoulder and head. But, when the uterus is much contracted, this is by no means easily done, to the extent which some demand; and the force which is required to move the head or shoulder, is very apt to prove hurtful. In these cases, it is quite sufficient to lay hold of the feet, and bring them down into the vagina, retaining them there by a ligature round the ankles. When this is done, the force of the uterus very soon pushes down the breech, and makes the shoulders and head turn up.

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* This natural turning of the child was first observed by the ingenious Dr. Denman. He was the first who proved, by experience, that when the hand projected into the vagina, and the shoulder was pressed down into the pelvis, by the action of the uterus, so as to make it impossible to turn, the woman did not die; but the child, by degrees, turned round, the breech or feet presenting. Vide Medical Journal, Vol. V.

Instead, then, of fatiguing the woman, or tiring ourselves, with attempts to pull down the breech, and deliver the child, we will act much more wisely to do no more than bring the feet into the vagina, when this can be done, and leave the rest to be accomplished by the natural contractions of the uterus.

When one or both of the feet present, the labour goes on smoothly. The same observation applies to the presentation of the breech.

Neither the belly nor the back can be properly said to present; because, although these may be felt early in labour, yet the action of the uterus soon forces either a shoulder or the breech to the os uteri.

Of the Umbilical Cord.

The Umbilical Cord is found universally in the animated kingdoms of nature, if by it we understand a system of vessels, connecting the fœtus to the placenta or uterus of the parent. It is found in birds, quadrupeds, fishes, and plants; but in these it is not uniformly of the same appearance; yet it must be allowed to exist, as in all these we find a communicating substance going out from the embryo to the placenta or membranes.

In the human subject, this cord consists of three vessels, of which two are arteries, and one is a vein. At the first view, this might appear to be contrary to the general order of the vascular system, the veins always being more numerous than the arteries: but if we attend more minutely, we shall perceive an exact correspondence, the office of these two sets of vessels being reversed in the umbilical cord and placenta. The arteries, therefore, which are to be considered as veins, ought to be most numerous.

These two arteries come out at the navel of the child, and run in distinct trunks, until they reach the placenta, when they ramify, like radii, and dip down into its substance. When they begin to ramify, the one artery sometimes sends across a canal to anastomose with the other. The vein commences in the placenta by a number of rays, each tending to the common trunk. The area of this trunk is double that of one of the arteries. Its insertion is the same with that of the arteries.

Although these vessels run in distinct trunks, without connexion, yet they do not run in a straight line, but assume a spiral turn, the one round the other. This twist is generally from right to left. Besides this turn, the vessels frequently form, at short intervals, coils upon themselves.

These vessels are completely destitute of valves.

The cord does not consist entirely of vessels, but also of a ropy tenacious gluten, contained in numerous cells, covered with a reflection of the chorion and amnion. In this gluten the vessels lie imbedded. The proportion of ropy matter is much greater in the early periods than afterwards, and the vessels are seen running in it like fine threads.

Besides the blood-vessels, there is in brutes another vessel, running along the cord, called urachus. This arises from the bladder of the fœtus, passes out at the navel, and runs along the cord, to a sac contained betwixt the chorion and amnion, called allantois. This is merely a cavity for containing the urine of the fœtus out of the body, whilst the urachus is the duct leading to it. The fœtus of brutes may therefore, be said to have a double set of urinary organs, two ureters, and a bladder within the body, and one ureter and a bladder without the body.

Many have asserted, that a similar structure existed in the human fœtus; but it is a mistake. There is, indeed, a connexion betwixt the bladder and the cord, but it is merely a small, white, ligamentous strip, running along the cord, and quite impervious. This, from analogy, has been called the urachus; but it resembles that vessel only in situation.

Glands, lymphatics, and nerves, have also been described, but have never been demonstrated in the cord.

Until about the sixth week, the belly of the fœtus is in contact with the placenta; but after this period, it begins to recede, and a cord of communication is perceived. About the eighth week, this cord is nearly an inch long; but the vessels are parallel to each other; nor do they begin to twist and become spiral, until the end of other two weeks.

The most common length of the cord, at the full time, is about two feet; but it has been found from six inches to four feet long and upward. When too long, it is often coiled up and entwined round the child; or, occasionally, it has knots formed on it, most likely owing to the child passing through a coil of it during labour.

The blood is received pure from the placenta by the umbilical vein, and conveyed by it to the navel of the child. Here the vein enters, and passes into the liver, dividing it into many branches, which ramify through the substance of that gland, whilst the continuation of the trunk runs forward, and terminates in one of the branches of the vena portæ. Thus we find, that one portion of the pure blood of the umbilical vein is distributed to the liver, whilst the rest is sent directly to the right auricle of the heart; but previously, it is mixed in its passage with the impure blood in the vena portæ and vena cava.

There is, then, by this contrivance, a mixed blood in the right side of the heart, which is purer than the venous blood of the fœtus, but much less arterial than the blood of the arteries after birth; from which we may infer, that a very great change takes place in the system and constitution of the child after delivery. When the right ventricle contracts, the blood is not sent through the lungs, as it is after birth, but directly into the aorta, at its curvature, by a vessel running from the pulmonary artery into the aorta. By this construction, we see that very little blood should enter the left auricle; and, consequently, that the whole left side of the heart should be almost empty. But to prevent this circumstance from happening, we find an opening or valve in the septum, betwixt the auricles of the heart, which permits the blood to flow from the right to the left side directly, and then the whole heart is equally filled. It is for preserving the heart in a state fit for acting after birth, that we have both a foramen ovale and a ductus arteriosus. Either of these individually would have served the immediate purposes of the fœtal circulation: but by thus dividing the blood, both the pulmonary artery and the left side of the heart are kept of a proper size, and in a due state of action *.

By the aorta, this semi-arterialized blood is distributed to the body; but instead of the whole blood in the descending aorta being conveyed to the viscera and inferior extremities, one-half of it is sent directly to the placenta; for the internal iliac arteries turn upward to the navel, through which they pass, and form the two umbilical arteries. The blood, therefore, which is returned to the placenta, is as pure as that which circulates in the arteries of the child; and, therefore, requires a less change to convert it into the state in which we find it in the umbilical vein.

Two diseases of the cord have been mentioned by practical writers, hernia, and rupture of the vessels.

The first is described by Wrisberg, Albinus, and many others, and must unavoidably be seen in every very young

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* The use of the sides of the heart is, in one respect, the reverse in the fœtus of what it is after birth. In the fœtus, the right side receives the purest blood, whilst the left receives it after birth. In the adult, the blood which is in a state fit for circulation, is collected in the left side; and, therefore, the great artery of the body arises from that side. On this account, there must of necessity be a communication betwixt the aorta and the right side of the fœtus, which performs the functions of the left side of the adult heart. If this communication does not close up after birth, then the contents of the right side continue still to be sent into the aorta. But as the quality of the blood of the right side is now materially different, very different consequences take place from those which resulted from the same mechanism before birth. The whole blood of the body is now rendered impure, the purposes of circulation are only half performed, and the unfortunate individual drags on a most miserable existence, until he sinks prematurely into the grave. One man, from whom I procured a preparation of this kind of heart, lived this unhappy life for forty years.

fœtus; for at first, the intestines are not covered, and the aperture remains longest at the navel. Few fœtuses, in the early period of gestation, are without this hernia, which differs in nothing from the umbilical rupture of the adult, except in very soon spontaneously disappearing.

The second is mentioned by several continental writers, but is exceedingly rare. It may be produced by the erosion of ulcers, the bursting of a varix, or, if we may credit some authors, by a sudden jerk, in consequence of an exertion of the mother. The symptoms produced by this accident, are pain and distention of the uterus, with faintishness, and the other consequences of hemorrhage. After these symptoms have increased to a certain degree, the distention of the uterus separates part of the membranes, by which an open flooding soon takes place. When, to stop this, the membranes are punctured, the waters flow out, coloured with blood, after which bloody clots are expelled.

This species of hemorrhage, then, when it does occur, will be distinguished, when it happens before the membranes burst, by a pain and swelling of the uterus, and a discharge of blood, owing to a separation of part of the decidua. The treatment is the same as in common cases of flooding.

Sometimes the cord descends in labour before the child, or is said, in the language of some, to present. This may happen in any posture or position of the child, and only, in so far as the life of the child is concerned, is to be considered as a troublesome circumstance. In this case, the cord may be returned beyond the head, or pulled to the side of the pelvis; or if the first of these methods fail to prevent its descent, and the second to prevent its compression, we may turn the child, and expedite delivery. If, however, the child be dead, it is unnecessary to attend to the state of the cord, because its descent makes no alteration in the labour, with regard to the woman.

This descent is frequently owing to the too great length of the cord. When the cord is too short, it has likewise been supposed to impede delivery; but this rarely occurs.

To conclude, there are not wanting men foolish enough to believe, that children have been born without a cord, and quite unconnected with the mother, the navel being skinned over. But it would be just as likely, that a man should live without intestines, or without a heart; and, therefore, I shall dismiss the subject.

Of the Placenta.

A placenta, or something analogous to it, is to be found attached to the young of every living creature. In some, indeed, such as the sow, the vessels terminate on the membranes, which perform the office of placenta; but, in most other animals, there is a defined substance destined for this purpose. In the cow, for example, we have numerous placentulæ, formed by efflorescences from the chorion, uniting with corresponding eminences, which arise from the uterus itself. These efflorescences, or collections of shaggy vessels, are called cotyledons, and the uterine eminences papillæ.* Another class have only one placenta attached to each fœtus, such as the female of the human species, the mare, and, so far as I know, all those who produce many young at a litter, each being contained in a distinct cell of the uterus; such as the rabbit, mouse, dog, cat, &c.

In some of these animals, the mouse and dog for example, the placenta is a cake, similar to those of the cow; but, in the cat and others, it is in the form of a zone or belt.

In birds we likewise find placentæ; but their form and structure are different; for, in them, there are separate and distinct portions to perform individually those functions which the placentæ of women and quadrupeds perform alone. Thus, vessels are sent from the chick to the yolk of the egg,* and to the membranes. One of these sets of vessels is destined for the function analogous to respiration, whilst the other seems to be solely appropriated for nutrition.

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* Some call the uterine eminences the cotyledon, and the fœtal part the placentula. Vide Med. Essays.

In the human subject, the placenta or gland to which the umbilical vessels run, is a flat circular substance, about a span in diameter, and, when uninjected, an inch in thickness. From its resemblance to a baked cake or biscuit, it has received its name of placenta or cake. It becomes gradually thinner from the centre to the circumference, by which it ends less abruptly in the membranes.

The common shape of the placenta is circular; but it is sometimes oblong, or divided into different portions; and Kirkringius tells us, that he has seen it consisting of seven separate lobes.

The umbilical cord may be fixed into any part of the placenta, or sometimes into the membranes, at a distance from the placenta. When this happens, the vessels run in distinct branches or trunks to the placenta, without forming any spongy substance on the membranes. Most frequently, however, the cord is inserted at a point about half way between the centre and the circumference of the placenta. From this the umbilical vessels spread out, like a fan, ramifying over the surface, and dipping down their extremities into the substance of the placenta itself.

On that surface of the placenta which is attached to the uterus, we observe it to be divided into lobes, with slight sulci between them. When recent, this surface appears to be covered over with a layer (of the decidua) like clotted blood; but, when washed and rubbed, its appearance is fibrous, and, to the touch, it is soft and spongy. It is, however, firmer toward the edges than at the centre.

That surface which is next the child is concave, (whilst

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[*] The albumen contributes likewise to the nourishment of the chick; but it is impossible here to describe the minute structure of the egg, or to detail its physiology.

the other, as long as it is attached to the uterus, is convex,) and is covered with the eminent trunks and branches of the umbilical vessels, over which we find spread the chorion and amnion. These cover the whole placenta, and afford an additional coat to the vessels.

By fixing a pipe into the umbilical vessels of a calf, we find that we can inject most minutely the cotyledon, but the papilla remains uncoloured. The reverse of this happens if we inject from the uterus.

If we inject from the umbilical vessels of the human fœtus, we find, that the placenta is rendered turgid, and vessels are to be found filled in every part of it; but always between their ramifications, there remains an uninjected substance. Even the uterine surface of the placenta is not injected.*

If we inject from the uterine arteries, we, in like manner, render the placenta turgid; but nothing passes into the umbilical vessels; and, when we cut into the placenta, we find cells full of injection, and covered with a fibrous uninjected matter.

From hence we may infer, that the placenta consists uniformly of two portions, the one arising from the uterus of the mother, the other proceeding from the fœtus itself. In every instance, the fœtal part is temporary, and perishes after delivery. But, in most quadrupeds, the maternal portion remains permanent, forming a part of the uterus itself. In the human subject, however, and in monkeys, both portions fall off blended together, and the surface of the uterus becomes smooth after delivery.

In order to understand this structure, I must anticipate what, properly speaking, belongs to the history of the membranes.

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* If we throw in warm water, and use considerable force, we may fill the uterine portion of the placenta, and from thence some of the uterine vessels. But this does not militate against the general fact, of an injection not passing from the one portion directly into the other. We might as reasonably suppose, that the arteries of the body terminated directly in the cellular substance, because we can render the hand œdematous by injecting water. In both instances, the effect is produced by transudation.

Before the embryo passes down through the Fallopian tube into the uterus, that organ is every where lined with a vascular substance, which is produced by the action of gestation taking place in the uterus. This, which has received the name of the tunica decidua, consists of two layers, the inner of which is entire, but the outer is perforated at the os uteri and entrance of the tubes. This outer layer enters, for about an inch, within the Fallopian tubes, and descends down the side of the cervix uteri to its mouth, terminating in that gluten which shuts it up.

The ovum is likewise covered with a vascular coat, consisting of shaggy vessels, arising from the chorion, and called the spongy chorion. Now, when the ovum descends from the ovarium, it remains, so far as we know, only like a hydatid, until it arrives at the bottom of the tube. Here it is prevented from falling into the cavity of the uterus, by the inner layer of the decidua, which lies across the opening, and which yields before it, gradually distending in proportion as the ovum enlarges, until at last it comes in contact with that portion of itself which remains attached to the outer layer.

Thus we find, that when the ovum descends into the uterus, it does not fall freely into the cavity, but is every where surrounded with a vascular coat from the uterus. With this coat the vessels of the chorion unite; and were we, therefore, at this period, to examine the ovum, we should find that its shaggy vessels, united at one part with the decidua, at the Fallopian tubes and at every other part with the inner layer, which it pushed before it, and which afterwards receives the name of the reflected decidua.

The embryo is at first a small speck, growing close to the side of its membranes, and most likely draws its support from that portion of the shaggy chorion which covers the part of the membranes to which it is attached. But, when it descends into the uterus, the decidua gives an additional covering, and joins its aid to the increased demands of the embryo; and the two vascular coats together form the placenta.

As that part of the membranes of the ovum to which the embryo is attached, generally enters the uterus last, it follows, if this account of the formation of the placenta be true, that the placenta will be formed originally over that part of the uterus, where the tube enters the decidua, at that spot joining with the chorion, to form it.* But in some instances the case is reversed, and the embryo enters foremost, the rest of the membranes following it. When this happens, then the inner layer of the decidua, which was stretched across the orifice of the tube, and which is afterwards to become the decidua reflexa, will contribute to the formation of the placenta. In this case, by the distention of the ovum, and the yielding of the decidua reflexa, the placenta will come at last to be inserted over the mouth, or over some inferior part of the uterus.

From this view, we see, that the shaggy vessels of the chorion form one portion of the placenta, and the decidua the other. It will farther be evident, that, at its very first formation, there will be no difference in structure or appearance betwixt the placenta and the rest of the vascular covering. It would, therefore, be impossible, in the very early period of gestation, to say what was placenta, and what vascular membrane, unless we observed the point at which the inner layer of the decidua began to separate or be reflected. We can then very readily understand the surprise which many have expressed at the magnitude of the placenta, in the beginning of pregnancy, when, in reality, it has been very small. Some have thought, that at first, the placenta surrounded the embryo; others, that its magnitude was accidental; whilst a third set denied what they examined to be a conception, but rather considered it as a mole.

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* This entrance of the ovum may be compared to the delivery of the child, at full time. In both, the membranes protrude first; at least, they always protrude first in labour, owing to the bulk of the child; and, most commonly, they protrude first from the tube, although, from the smallness of the embryo, this does not invariably happen.

But, when pregnancy is a little farther advanced, the placenta has a very different appearance; for then it is considerably thicker, in proportion to its breadth, than even at the full time. When we examine an abortion at the third month, we find the placenta considerably thicker than it is broad, and somewhat like an egg, one-half of which had been cut off. This appearance may be thought to depend upon the narrowness of the cervix uteri and vagina lengthening out the placenta during its passage: but we find the fœtal surface of the placenta very small in its diameter, and that it is not possible to stretch it out, so as to make the placenta thin.

The fœtal surface of the placenta is every where bounded by a duplicature of the true chorion, which dips down, at the margin of the placenta, toward the decidua, separating the decidua reflexa from the placenta, like a partition, and forming a rim all round it. This rim or duplicature may, so far as I know, be seen at every period. It is distinctly seen in the third month, in the sixth month, and even at the full time.

The placenta, we have seen, consists of two portions, the one formed by the vascular coat of the child, and the other by the vascular lining of the uterus. These two portions, after maceration, may, with ease, be separated, to a certain degree, from each other, during the first three months *.

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* When we separate these two portions, we may readily perceive, that the fœtal part shoots down all the way to the layer of the decidua, which covers the uterine surface of the placenta, whilst the maternal part shoots up to the chorion. The fœtal portion is arborescent, and consists of the most minute ramifications, springing from the greater branches of the umbilical vessels. The maternal portion has less of the arborescent appearance, but shoots out into innumerable irregular filaments or processes, having small cells betwixt them. It is not easy to observe accurately this structure; because the preparation must be suspended in a fluid, and shaken, to make the different parts expand.

The separation, however, is seldom, if ever, perfect, on account of the particular connexion of the one set of vessels with the other. But the formation of the placenta may, at this period, be very distinctly shown, without any maceration or separation; for, by simply raising the decidua from the uterine surface, we see it shooting into the placenta, like a coraline, and, by raising the spongy chorion from the fœtal surface, we see it likewise shooting down. By making a section of the placenta, we may demonstrate the same.

The structure of the fœtal portion, so far as we know, appears to be similar to that of the pulmonary vessels, the artery terminating in the vein. But the other portion is somewhat different; for here there is not a direct anastomosis, but the artery opens into a cell, and the vein begins from this cell; for, by throwing in wax by the uterine artery, we may frequently inject the veins. These cells communicate freely with each other in every part of the placenta. By pushing a pipe down into the substance of the placenta, at the insertion of the umbilical cord, and securing it there by a ligature round the cord, including the pipe, we may not only fill the cells, but also the vessels of the uterus; or, if we try the experiment in a placenta detached from the uterus, we see the injection spout out on the uterine surface. When we cut into a placenta so injected, we find its substance full of wax, and are assured that it is not an extravasation, by the regular and granulated appearance of the injection in the cells. The maternal portion, then, may be compared to the corpora cavernosa penis, and the fœtal portion to the pulmonary system of the adult.

When we cut into the cord, we find that the blood in the arteries is of a dark purple colour, whilst that in the vein is redder. From this we may infer, that the placenta is a gland, producing a change on the blood of the fœtus, simi-

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This produces a constant change of place, which the eye cannot readily follow, so as to examine it intimately. Both portions collapse when taken out of the fluid.

lar to that which the blood of the adult undergoes in the lungs.

From considering that the fœtus itself cannot create materials for its own growth and support, we may farther infer, that the placenta is the source of nutrition also. This nutrition, in the human subject, and in many other animals, seems to be performed entirely by the absorption of blood from the maternal, by the fœtal portion. But, in some other animals, it seems to be performed in a different way. Thus, in the chick, it is performed by the absorption of the yolk and the white of the egg, which seem to be converted into blood by the vessels which take them up, in the same way as the chyle of the adult is converted into blood in his vessels. In the cow, again, we can easily squeeze out a white fluid from the maternal part or papillæ, which most likely is absorbed by the fœtal part or cotyledon. We should, then, suppose, that the placenta of a cow was a double gland, one part of it secreting this kind of chyle, and the other acting as lungs. A third function might be added, namely, absorption.

In the human subject, the maternal part does not seem to be glandular, but merely contains blood, which is absorbed and taken to the fœtus by the umbilical vessels, which have a glandular action. Every secreting gland has two kinds of vessels, one carrying blood to it, and another performing the secretion. The liver, for example, has one set of vessels entirely appropriated to secrete bile, and convey it to the intestines; and another entirely appropriated to the conveying of blood or materials for the other to act upon. In the same way, there are two distinct sets of vessels in the placenta, the one conveying blood to it, the other possessed of the power of changing blood, similar to the lungs, and, perhaps, endowed also with the power of producing some other change on the blood absorbed from the mother.

The glandular part, then, is formed entirely by the fœtus; the other belongs to the mother, and may be yielded by any part of the body. For, in several instances, we find the outer surface of the uterus, the intestines, mesentery, or peritoneal covering of the abdomen, in extra-uterine conceptions, shooting forth vessels capable of conveying blood to the fœtus.

How this absorption is performed, or how these two sets of vessels are connected, is still a matter of conjecture. One thing, however, is certain, that the umbilical vessels do not open into or freely arise from the maternal cells, because they cannot be injected from them, any more than the biliary vessels of the liver and vena portæ may uniformly be reciprocally injected from each other.

Some have believed, that a direct communication did take place betwixt the fœtal and maternal vessels, and that the umbilical arteries of the child anastomosed with the uterine veins of the mother, whilst the arteries of the uterus were continued on to the child by the umbilical vein. If this were the case, we could easily, by fixing a pipe into the aorta of the mother, inject not only the whole placenta, but also the whole child. Instead of this, however, we can only inject the uterus, and one portion of the placenta. It would likewise follow, that, if the cord were not tied immediately after delivery, the mother would bleed to death; whereas, not above an ounce or two is usually lost in this way. I know that it may be said, that the reverse of this has occasionally happened; but granting this to have occurred once, from some peculiarity of structure or unnatural anastomosis, it will prove nothing, unless it be established as a general fact; for, if a direct communication be necessary, then, in every instance where the cord is not tied, the mother must bleed to death; which the experience of the youngest practitioner must prove not to be the case.

In the next place, the converse of this must likewise be true; and, whenever the mother loses blood, the child also must lose blood; and, if the bleeding from the mother continues, the child must die. But the collections of the writers on surgery disprove this, and show, that although the mother dies from the division of large vessels, yet the child remains as full of blood as formerly, and lives after the mother's death.

These facts are well ascertained in the human subject, but will derive additional confirmation from attending to the placenta of quadrupeds. In them, the two portions separate easily, and not only have no communication which we can detect by the syringe, but also are, in many of them, of a totally different appearance. In the deer, for instance, the one portion is sanguineous, the other has more of a gelatinous appearance. In the rabbit, the one portion is red, and the other white.

If we take a living pregnant bitch, and pull out a piece of the cord through a wound in one of the uterine cells, keeping the fœtus in its place covered with the waters, we shall find, that, if we divide the umbilical vein, and leave the arteries untouched, a quantity of blood will be lost, proportioned to the size of the fœtus, which will be found dead, and exhausted of blood. But if we tie the arteries before the vein be cut, very little blood is lost; and in neither of these cases does either the mother or the rest of the young suffer.

The placenta may be fixed to any part of the uterus, but most commonly it is attached to its fundus. Occasionally, however, it is found fixed over the cervix and os uteri, in which case it invariably produces a very dangerous hemorrhage. For, whenever the cervix begins to distend, a separation of the uterus from the placenta necessarily takes place, and the vessels bleed. If, by any means, this should be stopped for a little, it is sure to return, whenever either the coagula come away, or the cervix stretches farther. Even although it could be checked until the natural period of delivery, (which is scarcely possible,) it must then return from the dilatation of the os uteri, and the woman must speedily die, if assistance be not administered.

The older authors very simply imagined, that, in these cases, the placenta was not originally placed over the cervix, but that, by some very unaccountable means, it had slipt down from its proper place, making the membranes also, wheel round. Now, had this childish idea been true, the ovum must have been completely detached, and the placenta found lying loose over the os uteri, which is not the case.

There are two periods at which this attachment may produce flooding, namely, when the cervix begins to dilate, and when labour commences. It is, however, seldom delayed until the second period; for the distention of the cervix must produce a separation, which will bring matters much earlier to a crisis.

About the seventh or eighth month, the discharge of blood commonly appears, and continues violent for some time, until at last a coagulum restrains or diminishes it. But this coagulum soon gives way, and the flooding returns as furiously as ever, until at last the strength decays, and faintings come on. This is the case with all floodings, let the cause from which they proceed be what it may; and, therefore, whatever we may suspect, we cannot declare the placenta to be attached over the os uteri, until we examine. By introducing the finger, we feel the spongy substance of the placenta lying across the os uteri, at the same time that the under part of the uterus has a thicker feel than usual. It requires, however, some attention to be certain, that we really feel the substance of the placenta; for clotted blood retained about the aperture may deceive us; and it is not prudent, at first, to push much with the finger, or to turn it much about, because we thus increase the bleeding. A little time, however, generally determines the matter.

When flooding depends upon this cause, venesection, cold, and the usual remedies, may moderate or check it for a time; but the only radical cure is delivery. This, however, is, at first, difficult, or impossible to be accomplished, from the tightness of the vagina, and the firmness of the os uteri. The best practice, therefore, is, to restrain the hemorrhage, by cold applications, or a plug, until the parts will more readily admit of distention.* We then introduce the fingers, to dilate the os uteri, and either separate the placenta, or push our hand through its substance†; after which, we lay hold of the feet, and deliver slowly. I say slowly, because precipitation is useless, as well as dangerous, the body of the child acting as a plug, and restraining the bleeding.

Delivery, then, is the only chance of safety, and this we begin as soon as the state of the parts will permit us. Evacuation of the waters, which is useful in other species of flooding, is useless here, and ought never to be procured, unless as preparatory to delivery, when we are ready to perform it. The necessary prelude to this evacuation, namely, the separation or piercing of the placenta, must increase the discharge, instead of abating it.

Flooding, from any cause, and especially from this one, is a most dangerous accident, and the greatest risk to which a pregnant woman is exposed. Nevertheless, I firmly maintain, that it ought seldom to prove fatal, if the practitioner understands his duty. It is melancholy to know, that this is an axiom not universally believed, and that those who lose most patients, blush least for their blunders. A flooding is not a case in which we may temporise; it is not one in which we dare delay. Rest, venesection, cold air, cold drinks, and apothecaries phials, may, with propriety, be trusted to in trifling cases, or in bleedings which take place in the early months of gestation. Delay is here to be praised, and operations ought seldom to be talked of. But in those awful hemorrhages which take place in the end of pregnancy, no reliance is to be placed on the powers of physic; and procrastination, if it be not murder, is at least highly criminal. There is positively no excuse, at least in the generality of cases, for the loss of a patient from bleeding before delivery, when the pelvis is well formed. It is foolish to say, that delivery was impossible, and death unavoidable, because, in every instance where the flooding is such as to require delivery, it can be accomplished. When the neck is not fully dilated, when the mouth is firm, and its aperture small, rest, cold, and plugging, will restrain the hemorrhage until delivery can be effected. Until this can be done, the discharge is in smaller quantity, and the weakness produced less rapid, and less to be dreaded. I will not perhaps be far wrong, if I say that the effect induced by the moderate loss of blood, at this period, does good, because it renders the os uteri more easily dilated. I may have expressed myself too strongly, but I think it unjustifiable to permit the student to believe that he shall be blameless when he loses a patient from this cause, more than a surgeon who allows a patient to die from a wounded artery. I have known flooding prove fatal; but these instances confirm me in my opinion, and give me additional cause to lament, that too many who practise midwifery, imagine that a wish for the patient's recovery is sufficient to excuse them from pursuing early, decidedly, and unremittingly, that course which alone can give safety.

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* Until this can be done, the danger is not great, because, as long as the os uteri is firm and small, the bleeding is, comparatively speaking, inconsiderable. In this species of flooding, the quantity of blood which is lost marks the progress of labour, or the degree of dilatation; and whenever the flow is so great as to demand our immediate interference, we may be certain that delivery can readily be accomplished. The danger of the case, from immediate loss of blood, and the ease with which we can operate, are exactly proportioned to each other. The propriety, therefore, of not interfering manually too soon, will readily appear; because, at first, we may, by cold and plugs, moderate the hemorrhage, until the parts admit of delivery; whilst we should inevitably increase the discharge, by beginning our operation prematurely, at the same time that we did not, by this conduct, gain one single advantage.

† Pushing the hand through the placenta is by no means so adviseable as separating it, where this can be done; because the placenta, when attached over the os uteri, is generally less in circumference, and greater in thickness, than when attached at the fundus. We have, therefore, a great number of cells or vessels to tear, and find it difficult to pull the child through the mangled placenta, which will continually interrupt us in our operation.

A separation of the placenta, even when it is not fixed over the os uteri, will produce flooding. But the consideration of this may, with propriety, be delayed until we come to speak of the separation of the membranes.

The last observation which I shall make, relates to the retention of the placenta after delivery. This may proceed from three causes; from too firm adhesion to the uterus, from spasm, and from atony of the uterus.

The maternal portion of the placenta, or that part of the placenta which adheres to the uterus, is formed by the tunica decidua, or the caducous production of the uterus. It is by the efflorescence of this production, that the uterine portion of the placenta is formed; but we shall afterwards see, that a layer of the decidua may be separated from this cellular maternal portion; or, in other words, that the very outermost layer of the decidua vera does not contribute to the formation of the placenta, but is the intermedium of attachment betwixt it and the uterus. This layer, at full time, as will be afterwards shown, is very thin and gelatinous, and the vessels are exceedingly delicate, on which account the placenta in general separates readily after the birth of the child. Sometimes, however, this portion of the decidua is much firmer *, and the placenta adheres more strongly, becoming, in certain points, almost identified with the substance of the uterus. If the adhesion of the placenta be not universal, which is seldom the case, the portions which do not adhere separate, and the uterus being prevented from contracting, a hemorrhage takes place. In this case, the evident indication is, slowly to separate the placenta with the fingers, and extract it. If the adhesion be more general, and no bleeding be allowed to take place from its separation, then the only immediate injury which the woman sustains, is the mechanical irritation of the uterus, produced by the presence of the placenta. But, afterwards, more seri-

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* Sometimes portions of the surface of the placenta become so firm and hard, as to resemble ossifications.

ous consequences take place, from the putrefaction of the placenta *. I know that in some cases, the placenta has been retained for many weeks, and at last expelled, without any injury to the woman. But these cases are rare; and it is, at all times, warrantable and proper, to make cautious efforts to separate the attachment of the placenta with the fingers, after it has been retained for several hours, remembering, however, that too much freedom is not to be used in this way. There is a limit to our attempts; and if we continue them beyond this, we do *certain* mischief by the irritation, merely to escape a *probable* injury.

A more temporary retention of the placenta is produced by the uterus contracting round it, like a sand-glass; and this frequently, though not always, is attended with hemorrhage. It is the consequence of an irregular or spasmodic action of a particular part of the uterus. This is remedied by introducing the hand, and slowly dilating the constricted portion, after which we extract the placenta. Laudanum will also be useful, when the partial contraction is strong.

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* The system of pathology, which is founded upon putridity and depravation of the blood, is now most justly laid aside by most intelligent physiologists. But no one can ever think of denying, that the application of putrid matter to sensible and delicate parts, will be productive both of local injury and a general disease. The anatomist has sometimes fatally found that this is a truth; and the experience of every well employed accoucheur proves, that the application of putrid matter to the surface of the uterus, after delivery, not only produces a local affection, but also causes a febrile affection of the system, which often proves mortal.

When there is no flooding, we ought not immediately to make any forcible attempts to separate and bring away the placenta, or the portions which strongly adhere: but after several hours, and before any putrefaction comes on, we may renew the attempt, and shall generally succeed, owing to a separation naturally beginning to take place.

The placenta grows soft and putrid much sooner than an equal weight of muscle placed in the same circumstances.

When flooding takes place, then we must procure the contraction of the uterus, and the previous expulsion of the placenta, or its greatest part, by the continuance of regular and cautious endeavours to detach it.

Lastly, The placenta may be retained from a weakness or want of expulsive power in the uterus. This is of no consequence when unattended with hemorrhage. But sometimes this weakness is accompanied with bleeding; the same cause which prevents the expulsion of the placenta, depriving us also of the contraction of the mouths of the uterine vessels. Occasionally, in this state of the body and fundus of the uterus, the mouth retains its contracting power; in which case, the placenta is retained, the blood is poured out, part of it escapes, but still more remains, and distends the uterus, until it acquires almost its former bulk *. The same happens, if, during this torpor, we, in order to prevent the flooding, should plug the vagina without compressing the abdomen.

This is a very simple case; and yet I am sorry to say that I have known it prove a fatal one.

The indication here most evidently is, to extract the placenta, and by continuing the mechanical irritation of the hand, to excite the action of the uterus, assisting this by pressure on the abdomen. This, when duly persevered in, will seldom fail; but when it does, the woman never can die from the mere loss of blood, as long as we can plug the vagina, and prevent the enlargement of the uterus from effused blood, by pressure on the hypogastric region. Swathing the abdomen is a necessary precaution, immediately after every labour, to prevent the effect which would be produced by the sudden loss of that pressure which the intestines had been ac-

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* I have sometimes seen the uterus distended, after delivery, so as almost to reach the navel; and some authors mention, that they have seen it acquire its former size, though this I cannot believe. The clotted blood, provided that the woman survives, is either expelled by a kind of second labour, or it comes away in small pieces, mixed with serum or the lochia.

customed to during gestation; and it ought never to be omitted in a case of flooding after delivery. The plug ought, likewise, always to be had recourse to, when the torpor of the uterus is so great that we cannot excite its action soon enough to prevent a great quantity of blood from being lost. Cold applications to the belly and external parts, are useful adjuvants.

The propriety, or necessity, of exhibiting cordials, or opiates, after a flooding has continued for some time, will be pointed out by the state of the pulse, the degree of pain, and attending circumstances.

This torpor is most likely to come on after difficult and tedious labour; but it may, in any case, occur, in a greater or less degree. It is therefore proper, after every delivery, to inquire frequently, whether blood be lost; and when this does occur, it is most commonly from this cause.

When the directions already given are neglected, the bleeding continues until it be stopt or moderated by coagula, the weakness increases, head-ache, vomiting, and difficulty of breathing, come on, not unfrequently attended with hysteric or convulsive fits; and very soon the increasing weakness ends in death: for there is a certain degree of loss of blood, beyond which the patient cannot survive, even although for some time before death further hemorrhage be prevented. On opening the body, the uterus is found flaccid, and full of clotted blood.

Of the Membranes.

The membranes form a sac, which lines the uterus all round, and contains a fluid in which the fœtus swims.

In the beginning of pregnancy, we find four coats, which, collectively, receive the name of membranes: but, when gestation is nearer a conclusion, we find only three, the two outermost becoming so intimately combined that they seem to form only one.

There are, however, only two coats which, strictly speaking, deserve the name of membranes, the amnion and the chorion; for the other two have not the appearance of membranes.

Of the Amnion, and the Fluid which it contains.

The innermost membrane, or amnion, is thin, pellucid, and totally without the appearance of either vessels or regular fibres; yet, in the end of pregnancy, it is stronger than all the rest taken together. But, at first, the chorion is the strongest of the two: it lines the whole of the membranes, covers the placenta, and mounts up on the navel string, affording a coat to it all the way to the umbilicus, where it terminates.

It is said, in a general description, that it lines the next membrane, or chorion; but, except upon the placenta, it is not in absolute contact with it, there being interposed betwixt them a stratum of clear gelatinous substance. The distance, however, betwixt these two membranes is exceedingly trifling in advanced gestation; but, in the early months, it is considerable, and they are seen, the one like a small oval suspended within the other, which is a larger one, the intermediate space being filled with thin jelly*: but, even at this period, they are nearly in contact at the region of the placenta.

The sac formed by the amnion is filled with a fluid which appears to be composed chiefly of water, with a very little earth, mucus, and sea salt. As this water is contained within the amnion, it has received the name of the fluid, or liquor of the amnion, of the agnina, or amiculum, all which names this membrane has received, on account of its being supposed to cherish the fœtus. In general, the liquor amnii is almost free from colour; but, occasionally, it has a greenish hue, which is supposed to proceed from a solution of

* Vide Plate II. fig. 2.

part of the meconium; at other times it is bloody, in which case the child is generally dead, and more or less putrid.

The quantity of water, upon an average, which is contained within the amnion at the full time, is about two English pints; but sometimes it is much more, and at other times scarcely six ounces. In the early periods, the quantity is larger, in proportion to the size of the uterus, than afterwards*. Riolan says, that it amounts to three or four ounces when the embryo is no bigger than an ant; but this is an extravagant calculation. It is certain, however, that, were the quantity of water to increase in the same ratio, during the whole of gestation, which it observes at first, it would, in the ninth month, weigh more than the woman herself.

Various opinions have been entertained concerning the origin of this fluid; and there is no source, however trifling, which has not been taken into account. The sweat, the urine, the saliva, and the mucus of the child's nose, have been all enumerated, as contributing to its production, even before the child had a nose to secrete mucus, or organs to yield urine. Others supposed it to be an exsudation from the cord or amnion, or an excretion from some supposed glands or lymphatics. Its true source is still a secret; nor is it of much consequence that we should discover it. It is, however, clearly a production of the mother; because it is found, in the greatest proportion, when the embryo is most imperfect, and least able to furnish it. Some have likewise thought, that they have observed it to be in larger quantity when the child was feeble, than when it was strong.

Haller, whose name ought always to be mentioned with respect, quotes two authors to prove, that, when the mother took saffron, the liquor amnii became yellow. Levret mentions, that, in one instance, it contained mercury, when the mother had undergone a mercurial course; but this is much to be doubted.

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* Although this be the case, yet the uterus is less completely filled in the beginning than in the end of gestation.

The use of the liquor amnii is twofold:

First, It defends the fœtus, by allowing it greater freedom within the cavity of the uterus, and prevents the sides of the womb from being so much pressed against the child as they otherwise might have been*.

Second, It assists labour; for whenever the uterus begins to contract gently, the membranes protrude, distending the parts gradually, and at last, by their bursting, they excite stronger action, as has been already mentioned.

Formerly it was believed, that the child drank the liquor amnii, and consequently voided it again by urine, or sent it off to the placenta. But the single fact, of children being born without a mouth, and yet strong, is sufficient, experimentally, to disprove what never could have been supposed by any one who thought accurately on the subject.

When the water is in too small quantity, it confines the child, and, by making more of its surface press on the neighbouring parts, may compress the nerves, and occasion cramps in the legs and thighs†.

When in too great quantity, it produces inconvenience, by the distention of the uterus and pressure on the viscera. This is to be considered as a dropsical affection.

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* The quantity of fluid bears always an exact proportion to the delicacy of the child, and the injury which it would sustain from pressure. The utmost care is taken by nature to preserve the embryo, whilst it is yet soft and imperfectly formed. There is not only a greater quantity of fluid to defend it, but also the bag which contains it is suspended within a second sac, which, in like manner, contains a fluid.

† It has likewise been supposed, that, if the water was in small quantity, the child might, from the pressure and confinement, become deformed: but this can very rarely be the case; because the liquor amnii is always copious when the fœtus is forming, and only diminishes when the formation of the child is so complete, that little effect could be produced by confinement. I do not see that we could account for a hand or a foot being turned awry, on this supposition, more than for a child being born with the cranium open and the brain wanting.

Of the Chorion.

The chorion, like the amnion, is thin and transparent. It is thicker and stronger than the amnion in the early months; but after the middle of pregnancy, the relative strength is reversed, and the chorion becomes weakest *.

It lies exactly on the outside of the amnion, but is never absolutely in contact with it. In the early periods, the distance is great, and the intervening space filled up with their jelly. Even in the ninth month, this intermediate jelly may be found, though in very small quantity. After delivery, it becomes so tough, that it may be separated from the chorion or amnion, as if it were a layer of these membranes.

The chorion, as well as the amnion, covers the placenta and the whole of the cord; and, at this place, there is either no intervening jelly, or it is in very trifling quantity.

These two membranes adhere firmly along the cord in the end of pregnancy; but in the very beginning, they join each other only near the navel. There is at first no cord, the fœtus or embryo being in close contact with the membranes; but by degrees it recedes, and a cord of vessels connect it to the placenta. This is always covered closely by the chorion; because this membrane is kept firm by its attachment to the placenta and exterior vascular coat. But the amnion is loose, and has no such attachment: therefore, the cord, when the child first begins to recede, is not covered close by it. On the contrary, it is drawn out rather like a funnel, adhering to the cord only near the navel.

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* This remark, however, does not apply to that portion of the chorion which covers the placenta; for this not only preserves its original strength, but even appears to become firmer, preserving, to the amnion, its former relative thickness and density.

But gradually, the adhesion spreads, and we quickly find it united to the whole cord, except a small portion near the placenta. Here likewise, the adhesion, after some time, begins to take place: but even in the ninth month, we may generally, by inflation, separate the amnion, for a little way, from the cord. This is called the processus infundibuliformis of the amnion *.

The chorion adheres firmly to the placenta, and covers all the vessels which run on its surface; but it does not dip down with them into the substance of the placenta.

All round the placenta, at its margin, the chorion forms a small duplicature, which dips down, and seems to separate the placenta from the vascular membrane or coats. This rim may be observed in the ninth month; but it is most evident in the sixth month, and before it.

The chorion, when the ovum first descends, is every where covered with vessels, which sprout out from it. These form a covering to it, which, from its appearance, has been called the shaggy or spongy chorion. These vessels, at least such of them as sprout from that part of the chorion which corresponds to the attachment of the embryo, are destined to support the embryo, and form the fœtal or umbilical portion of the placenta. All the rest, or those which cover that part of the chorion which is not in contact with the placenta, cease to enlarge, as if blighted in their growth by the increase of those which form the placenta. These blighted vessels, however, if such I may term them, do not become useless, but unite with the decidua reflexa, and serve to attach it to the chorion.

Between the chorion and amnion, there is, in the commencement of pregnancy, to be found a small bladder, called vesicula alba, on account of its containing a white fluid. This lies on the concave surface of the placenta, about an inch from the insertion of the navel string, and from it there may be traced a very fine white line, for a considerable way

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* Vide Albini, Academ. Amnot.

along the cord, and sometimes even to the navel itself. This line has been called the urachus, but very improperly; for although the fluid can be squeezed along it for a little way, yet it soon becomes quite impervious. This vesicle has a small artery and vein sent from the end of the cord to be distributed on it.

The use of the vesicula alba is perfectly unknown; but it is evident, that it must serve some useful purpose in the fœtal economy.

In quadrupeds, there is a bladder like this contained between the two membranes; but it is incomparably larger, and is connected to the bladder of the fœtus, by means of a tube running along the umbilical cord. This tube, which is named the urachus, arises from the bladder, and continues small, as long as it runs in the cord; but when it reaches its extremity, it dilates, and insinuates itself betwixt the chorion and amnion, forming the bag which is called the allantois. Some have asserted, that they have found this receptacle in the human subject; but, the vesicula alba excepted, there is nothing perceptible which can be compared to it; and it is not very likely, that a bladder, capable of containing the urine of a fœtus for nine months, should be invisible, if it existed or were necessary. It is, indeed, true, that sometimes we find people who have evidently an urachus continued to the navel, through which they discharge their urine. This I have seen, and Albinus* mentions several who have observed the same. But whether an allantois might have been found in the membranes of these people, had it been looked for, it is impossible to tell. This much, however, may, with certainty, be said, that if it had been found, it would have been a very uncommon occurrence, and that, naturally, the human fœtus has no such appendage.

It may not be improper to add, in order to prevent confusion in reading the works of old authors, that many of them call the chorion the allantois or false allantois, whilst they gave the name of chorion to the vascular covering.

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* Vide Albin. Acad. Annot. Lib. I. cap. vi.

Of the Caducous, or Vascular Lining of the Uterus.

The last coat to be described, is one yielded entirely by the uterus; and, in the beginning of pregnancy, consists, according to Haller, of naked vessels shooting out from the sides of the uterus. But, after a very short time, it becomes a soft porous membrane, easily torn, and of a filamentous structure. This, as Harvey observes, is not a coat of the fœtus, but a lining of the uterus, which falls off after delivery; and, therefore, is called the caducous coat, or membrana decidua.

The anatomy of this production is exceedingly simple, and may be explained in a few words.

Immediately after conception, vessels sprout out from the uterus, and from the Fallopian tubes, for a little way within their cavity. These soon assume the appearance of a membrane, which may be divided into two layers. The outer of these is perforated in three different places, at the cervix uteri, and at the insertion of the two tubes; because the action which forms this layer extends only a little way within the tubes and down the cervix. The inner layer is entire in every place, and, therefore, is extended or spread over these openings*.

When the embryo passes down through the tube, it is stopped, when it reaches the uterus, by this inner layer, which lies across the aperture, and thus would be prevented from falling into the cavity of the uterus, even were it quite loose and unattached. By the growth of the embryo, and the enlargement of the membranes, this layer is distended, and made to encroach upon the cavity of the uterus. This distention gradually increases, until at last the whole of the cavity of the uterus is filled up, and the protruded portion of the inner layer of the decidua comes in contact with that portion of itself which remains attached to the outer layer. We find then that the inner layer is turned down upon itself, covering the chorion; from which circumstance, it has been called the reflected decidua, or decidua reflexa*.

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* It is necessary here to correct a mistake of some who puzzle themselves to find out how the ovum gets behind the decidua reflexa, seeing that the orifice of the tubes is not covered by it. They have made a mistake in anatomy.

Thus we see, that whenever the ovum descends, it is encircled by a vascular covering from the uterus, which unites in every point with those shaggy vessels which sprout from the chorion, and which make what was called the spongy chorion. One part of these vessels forms placenta, and the rest gradually disappear, leaving the chorion covered by the decidua reflexa. This obliteration begins first at the under part of the chorion.

The reflection of the decidua, or its doubling down upon itself, is absolutely unavoidable, from the distention of the

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* The annexed plate exhibits a plan of the membranes in the different stages of gestation, and will assist the reader in understanding the description.

Fig. I. (*a*) The cut edges of the uterus.

(*b*) The Fallopian tubes, with the external layer of the decidua entering for some way within them.

(*c*) The two layers of the decidua, or shaggy fringed-like lining of the uterus.

(*d*) The dark coloured embryo, inclosed within the amnion.

(*e*) The chorion, covered with its own shaggy vessels, and the protruded portion of the inner layer of the decidua, forming the decidua reflexa.

(*f*) The mucus, which shuts up the os uteri, with the decidua terminating in it.

Fig. II. (*a*) The chorion, covered with the decidua reflexa.

(*b*) The amnion.

(*c*) The placenta.

The other figures represent the ovum at a more advanced period, but require no explanation.

FIG. I.

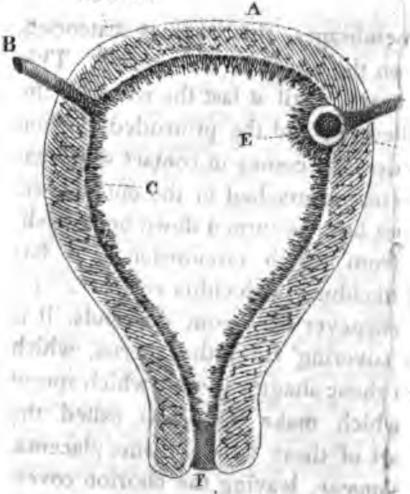
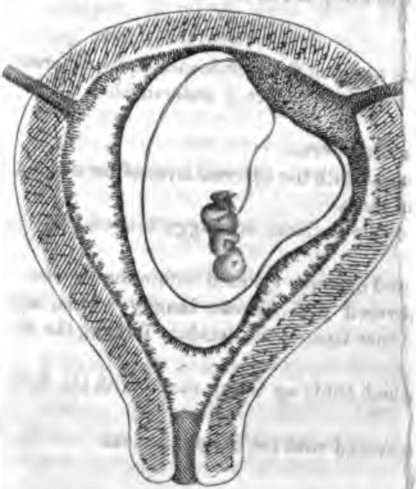


FIG. III.



ovum; and the manner in which it does so is very easily understood. Yet, so far as I have seen, most students have at first been much perplexed with it. Even those who ought to have been best able to demonstrate this to others, mislead the reader*, and contradict themselves. Thus we are told by Dr. Hunter, that "the decidua vera divides it-"self at the edge of the placenta, into two laminæ, one of "which passes between the placenta and the inner surface of "the uterus, and the other forms the decidua reflexa, which "covers the outer surface of the chorion†." And in the explanation of his valuable plates, he uniformly marks, that, at the edge of the placenta, the decidua begins to be reflected‡. So far he is right; but how are we to reconcile this with the following passage, either of his own or his editors, in his posthumous work? "The decidua," says he, "grows thicker and more vascular, towards the placenta, "at the very edge of which it acquires a considerable thick-"ness, and, splitting into two strata, is continued over both "surfaces of the placenta, but especially the inner smooth "surface, blending itself there inseparably with the umbili-"cal portion of the placenta§."

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[*] Dr. Hunter himself, (or his editor) although he confesses, that, in two cases where the decidua was formed, no ovum could be detected, yet conjectures, "that the ovum passes from the ovarium into the cavi-"ty of the uterus, while the coagulable lymph is pouring out by the "arteries of the uterus, which is afterwards changed into decidua." And adds, that "one can hardly imagine that the ovum should make "its way into the middle of a membrane which is already formed, and, "though tender, yet capable of some degree of resistance."

Anatomical Description, &c. p. 83.

[†] Anatomical Description of the Gravid Uterus, p. 80.

[‡] Plates of the Gravid Uterus, plate xxxii. fig. 2. The letter M shows "the angle near the edge of the placenta, where the inner layer "of the decidua is turned over the chorion, to form the decidua reflexa."

[§] Anatomical Description of the Gravid Uterus, p. 54.—In order to prevent the student from thinking that this assertion is an error commit-

After this general account of the tunica decidua uteri, it will be proper to make a few more particular remarks on the two layers.

I. *The Outer Layer of the Decidua Externa*[*].

This, together with the other layer, is formed very soon after conception, and before the ovum descends. It lines the uterus every where, and enters into all its openings. It penetrates, for an inch, within the tubes, and shuts them up after the descent of the ovum, so that no probe can be passed through them into the uterus. It descends down the cervix uteri, and is lost in that mucus which shuts up its mouth. But the most important point in its history, is, that it unites with the vessels of the chorion, and forms a placenta. It has been said, that the umbilical vessels formed the placenta, or that this gland consisted entirely, or almost entirely, of their ramifications. But there is no anatomical point more clearly proved, than that these vessels form only a part of this substance, the rest being produced by the decidua externa and its vessels, forming cells. These two portions may, soon after the formation of the

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ted from hurry, the editor, Dr. Baillie, thinks it proper to add in a note, that "the layer of the decidua, which lies between the chorion "and the placenta, is, in one case, much thicker than in another. It "sometimes forms a smooth tender opake membrane, but is more frequently reticulated, and occasionally there are portions of it a good "deal thicker than the rest, and which, shining through the transparent chorion, bear some resemblance to pieces of fat. This layer is "generally thicker than that which adheres to the rough external lobulated surface of the placenta." The membrane here alluded to is not part of the decidua, but is the spongy chorion which forms the fœtal part of the placenta.

[*] This is called decidua vera by Dr. Hunter; but surely the decidua reflexa deserves the name of *vera* as justly as this layer.

placenta, be separated from each other, like the papilla and placentula of the quadruped; and it is chiefly, if not entirely, for the purpose of forming this portion, that the decidua exists. For in all quadrupeds, where the maternal part remains permanently fixed to the uterus, no decidua is found; whilst in those who have no papilla, such as the tribe of monkeys, this coat always exists.

This layer, soon after the descent of the embryo, unites completely with the inner layer; and, therefore, if we were now to examine it, we would say, that the decidua split into two, at the edge of the placenta, one of the divisions going into the placenta, and the other spreading over the chorion.

The outer layer may, with care, be divided into several thinner laminæ, one of which always is continued over the uterine surface of the placenta, whilst the rest terminates in the placenta, and forms its uterine, or maternal portion. Hence the placenta, or at least its cellular and fibrous part, does not adhere directly to the uterus, but has a thin lamina of decidua interposed betwixt it and the uterus. This lamina, however, in the early months, adheres firmly to the more interior lamina, which forms the placenta. Therefore, when we attempt to raise it up, we draw out the placentary substance, in the same way as we do when we raise the chorion from the umbilical surface. This lamina is described by Noortwyk and others, and is supposed to send up processes betwixt the lobes of the placenta; but this is a mistake. This lamella is pretty thick and tough for some months, but it afterwards becomes much thinner, and very delicate, so that, after delivery, we find it resembling a thin layer of coagulable lymph, or red jelly, spread over the placenta; and on its surface, we may observe the torn convoluted vessels which ran from the uterus to the placenta.

At first, the decidua externa, or vera, by which I mean the two united layers, is of considerable thickness; and after being dipped for a time in spirits, appears evidently to be of a spongy, or fibrous structure: but towards the end of gestation ,it becomes very thin, and mor elike jelly, or tough mucilage, than a vascular coat. Even at this time, however, it is thicker near the placenta than elsewhere. But it cannot be now divided into laminæ: we can only separate it from the decidua reflexa, which is easily done, insomuch, that in many places it remains adhering to the uterus; and in these places, the chorion is found only covered with the decidua reflexa. These detained portions soon come away with the lochia.

Although the decidua grows thinner toward the end of pregnancy, yet it adheres more firmly both to the uterus and the rest of the membranes, by which the chance of separation is diminished. In proportion, therefore, as this separation would be dangerous, the risk of its taking place is lessened.

The decidua is very plentifully supplied with blood-vessels of considerable size, but so very delicate, that they are thinner, and weaker, than what is called silk paper. The vascularity of the decidua is not a very late discovery, although one ingenious anatomist, lately dead, seems to claim it. Van Swieten * tells us, that he saw Noortwyk inject a gravid uterus from the iliac artery, by which he filled the cellular covering of the uterus and chorion: or in other words, the decidua, and decidua reflexa.

II. *The Inner Layer, and Decidua Reflexa.*

The reflection of one part of this layer, forming the decidua reflexa †, and the complete union of all the rest of it with the outer layer, forming to appearance only one membrane, called decidua, decidua externa, or decidua vera, has been already mentioned. From the description already given, it will appear, that the situation of the protruded, or reflected portion, must be different at different times. Until the ovum descends, the two layers are intimately in contact in every part; but when the ovum reaches the uterus, it must either be retained in the tube, or rupture the inner layer, which goes across the opening of the tube, or it must push it out before it. The last of these events happens, and the distention, or protrusion, continues until the ovum, with the distended decidua, comes in contact with the rest of the membranes which line the uterus. This happens about the third month. We shall therefore find, in our examinations made in the intermediate periods, the decidua reflexa projecting more and more into the cavity of the uterus, and approaching nearer and nearer to the decidua, in proportion as gestation advances.

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* Comment. in Aph. 1304.

† Decidua protrusa would be a better name for this portion.

The decidua reflexa, like the decidua which lines immediately the uterus, or the decidua vera, as it has been called, is much thicker in the beginning than in the end of pregnancy. It is smooth and dotted on the surface next to the chorion, and shaggy on the other; and in this respect, it differs from the decidua externa, or vera, which, when separated from the uterus, appears shaggy, or fringed on both surfaces: but in the end of gestation, it is exactly the same with it.

At first, the decidua reflexa unites with the shaggy vessels of the chorion; but these, by degrees, disappear, and the reflexa comes in contact with the chorion.

The best period for examining the decidua is in the sixth month, for then we find it exactly in the same relative situation as in the ninth month, whilst it is not so thin and tender. At this time, we can always, by a little previous maceration, and then dipping it for some hours in spirits to harden and define the parts, observe, that the decidua, just at the edge of the placenta, is separated into two layers, or divisions, the outer of which is continued into the placenta, whilst the inner turns obliquely down upon itself, covering the chorion.

At this time, by a little care, and after the preparation already mentioned, we may separate the two layers of the decidua, by beginning at the point of reflection. This being done, we find the chorion to be covered with two laminæ; first, the inner layer of the decidua (vera,) which we have separated from the outer layer; and, second, the reflected portion of this layer, or the decidua reflexa. This reflected layer is like an entire cap, or flask, enclosing all that part of the chorion which does not cover the placenta; but the other lamina, or the inner layer of the decidua, is not entire, being discontinued at the os uteri; for it is part of the decidua vera.

We likewise find, that, by cutting the angle of reflection, we can, by care, separate the reflected portion of the inner layer from the decidua vera. This being done, we find the chorion covered with the decidua reflexa, and the uterus lined with the decidua vera, which, as was mentioned before, consists of two greater layers, but may, by care, be still farther subdivided.

Lastly*, we may separate the chorion from the decidua reflexa, when we shall find the surface of the reflexa to be full of dots, which, most likely, are produced by the shrivelling, or conversion into ligaments, of those shaggy vessels of the chorion with which it had been originally blended †.

Such being the state of the decidua in the sixth month ‡, which is the most advanced period at which I have had an opportunity of examining it while remaining in the uterus, I shall now add, that, after delivery at the full time, the structure is much less distinct, and the appearance of reflection cannot possibly be perceived. At this time, the termination of the decidua is still very evident; but the decidua, the placenta, and the decidua reflexa, adhere all so together, that no angle, or appearance of reflection, can be observed. On the contrary, a kind of polypus-like substance, or lymphatic excretion, surrounds the rim of the placenta.

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* This account may, to some, appear to be tedious; but I will rather incur the imputation of repeating too frequently, and illustrating too minutely, than leave the reader in any doubt as to the connections and appearance of this tunic.

† When we separate these membranes, in the third month, we may observe these vessels, in many places, still red, and efflorescing from the chorion.

‡ I have given the description from the dissection in the sixth month; but I might have had recourse to preparations at a much earlier period, as in them the structure of the ovum is equally well marked, I have only preferred the sixth month, because the situation is exactly the same then as in the ninth month.

The decidua, and decidua reflexa, may, at this time, be still separated from each other, until we come to about a line from the placenta. Here, as was just now mentioned, they become blended together, or unite strongly. When we trace the decidua from the uterine * surface of the placenta, and the spongy chorion from the umbilical surface, we find them likewise terminating in this line, or rim. At the meeting of these two, there is generally an angle formed, which is sometimes filled with coagulated blood, but more frequently with lymph, which makes the placenta appear to be surrounded with a firm yellow margin.

The spongy chorion, or shaggy vessels of the chorion, which form the placenta, and afford, by their condensation, a firm covering to the umbilical surface (in the same way as the outer lamina of the decidua covers the uterine surface of the placenta,) and which disappear, as has been al-

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* It was formerly mentioned, that, besides the division of the decidua into two greater layers, it might also be separated into several thinner laminæ, one of which could be traced over the uterine surface of the placenta, whilst the rest formed part of that gland. It is this lamina which I here allude to, and which we trace from this polypus-like rim over the placenta, whilst the rest of the decidua, with the decidua reflexa, appears to run into the placenta itself. Were we, therefore, to examine the membranes at this period only, we would deny the existence of a reflected decidua.

ready mentioned, on the chorion producing a dotted appearance on the surface of the reflexa, may here be seen pretty large, and converted into a kind of tendinous fibres.

The ancients appear to have known the deciduous coat of the uterus; but it was the celebrated Dr. Hunter who first pointed out the reflection of part of it.

For some time, the decidua, although it increases in its surface, yet does not diminish in thickness; but, after the sixth month, it grows gradually thinner, in proportion as the uterus expands, and it becomes larger. By the end of the ninth month, it is much softer, and greatly thinner than formerly; on which account, the separation of the lower part of the uterus, from the decidua, which necessarily takes place when labour begins, is followed by only a very trifling discharge of blood. If this diminution of thickness, and, consequently, of vascularity, had not taken place, then a much greater quantity of blood must have been lost, as we see exemplified in abortions, or those labours which take place before the decidua has become thin. Even in the seventh month, the common term for premature labours, there is often a considerable discharge of blood, but seldom indeed to such an extent as to be called a flooding, unless the labour has been induced by such causes as produce a separation of the membranes more extensive than common.

The dilatation of the mouth of the uterus, in natural labour, uniformly produces a certain degree of separation of the membranes; and, consequently, more or less blood follows. But sometimes, from the operation of many different causes, a more extensive separation of the decidua takes place, either during labour, or during gestation. This regularly produces hemorrhage, which is always followed by abortion, if the quantity of blood lost be great; or, in other words, if the separation be serious and extensive.

We can easily conceive how blows and falls should produce this separation; but there are more obscure and unperceived causes, which are likewise capable of inducing the same effect. The application of cold, fatigue, costiveness, and passions of the mind, in a very great number of cases, do, by their action on the uterus, become the exciting causes of abortion. We cannot, however, in every instance in which they operate, detect their existence, because they do not commonly produce, immediately, any very sensible effect upon the uterus. It is by no means unfrequent for several days to intervene betwixt the application of the cause and the appearance of the hemorrhage; on which account, the true cause is often forgotten, or overlooked. It is, however, chiefly, or almost entirely, in the beginning of pregnancy, that these slighter causes produce their effect; because then the attachment of the placenta and decidua to the uterus, is much more delicate than afterwards, and the action of the different parts is less perfect.

Besides these causes, the death of the child will likewise produce a separation of the membranes, because then the connexion and sympathy existing betwixt the child, the placenta, and the uterus, are affected. The fœtal vessels in the placenta cease to act, which is very soon followed by such a change in the maternal part, as to produce a separation. It is difficult to say, whether this be frequently the cause of abortion; because it does not follow, that, when no other cause can be detected, we must ascribe it to this one. On the contrary, many cases of abortion appear to depend upon a morbid habit of the uterus, by which it ceases, at a certain period, to act and enlarge any longer. At least, we may infer this to happen, from the regularity with which some women abort, whenever their pregnancy advances to a certain period, and that without any evident cause, and in spite of every precaution.

Constitutional diseases, or affections of the system, likewise produce this effect very frequently, particularly syphilis and febrile diseases, attended with a cutaneous eruption.

A want of correspondence in the distention of the uterus, and the enlargement of the decidua, will likewise, of consequence, produce a separation. If, for instance, the decidua follows its usual progress, whilst the uterus expands prematurely, or if it remains thick, and stops in its distention, whilst the uterus enlarges in the proper ratio, then the cervix uteri must be separated from the decidua, which it formerly embraced. This, in one point of view, is a case exactly similar to that in which the placenta is attached over the os uteri; for in both, the separation proceeds from a want of correspondence in the enlargement and actions of the uterus, and of the vascular substance in contact with it. But the cases differ materially in this, that less blood is lost in the one than in the other, the duration of the bleeding is much longer, and the cure is different; for, when the separation of the decidua causes the discharge, puncturing the membranes abates the flooding, which, in the other case, it does not do.

When the enlargement of the uterus, and the extension of the decidua, do not correspond, the woman never can go to her full time, but will, from the separation which necessarily takes place, be delivered at a period, early in proportion to the time when the uterus and its linings ceased to act in concert.

When the causes inducing a separation of the decidua, or placenta, act slowly, and in the beginning of pregnancy, the woman generally complains first of coldness and shivering, followed by a greater or less degree of pain in the bowels and uterus, with a discharge of blood, which is accompanied with heat of the skin, head-ach, thirst, frequency of pulse, and often with sympathetic affections of the stomach or lungs. But if the causes operate rapidly, or in the end of pregnancy, in which case the progress of the disease must be quick, then the discharge commonly appears without any previous affection; and neither the general system, nor particular organs suffer, until some time after the discharge has appeared.

Abortion may happen at any period; but it is most frequent when the cervix first begins to distend, about the third or fourth month.

The practice here is much the same as in other hemorrhages, from internal parts. The general force of the circulation, or the action of the vascular system, is to be diminished, by bleeding, by rest, and by the removal of heat and other stimuli; whilst we, at the same time, lessen the action of the uterus itself, by the application of cloths, dipped in cold water, to the labia and vagina, and by the removal of costiveness, should it exist. If, after these means have been employed, the pain continues, opiates, conjoined with antimonials, may very usefully be administered.

By this treatment, a farther loss of blood may sometimes be prevented, and the detached portion of the decidua, if it be small, be made again to adhere. But when the disease is produced by the death of the child, or a morbid habit of the uterus, or, when a considerable portion of the membranes, or placenta, is detached, this desirable event will not take place. On the contrary, the hemorrhage, though moderated, still continues in a less degree, the blood insinuates itself betwixt the decidua and decidua reflexa, and betwixt the decidua and uterus, separating, by its coagulation and retention, still farther, the ovum from the uterus, which, now excited to action, begins slowly to contract and expel its contents.

In the early months, the simple means just mentioned will be quite sufficient; and all manual assistance is both impracticable and improper; because the mouth and cervix of the uterus, are too firm to permit the extraction of the ovum; and if, in hopes of lessening the size of the uterus, and thus diminishing the bleeding, we burst the membranes, we only prolong the disease, and retard the expulsion of the ovum *. Even although delivery or extraction were

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* In a great many cases, the membranes burst in the course of the disease; but this is not a desirable occurrence, and, luckily, does not

practicable, it would seldom be necessary to have recourse to it; because in almost every instance, the means already taken notice of, will be sufficient to prevent any bad or fatal consequences, from the bleeding, before expulsion takes place naturally; and in those rare cases where they are not, plugging the vagina with cold compresses, will prevent any farther discharge, until the action of the uterus expels the whole.

The flooding which attends an early miscarriage, is, indeed, a disagreeable accident, but can, by no means, be compared to those dreadful hemorrhages which occur after the sixth month. The vessels are now so large, that the separation of even a small portion of the placenta * must be attended with a very profuse bleeding. This event may take place, either before labour, or during it; and must, of necessity, appear in every case where the placenta is attached over the os uteri. But this having been already noticed, the present observations may be confined to those separations which take place when the placenta is attached to its proper place.

This is always marked and distinguished by a flow of blood, and by our feeling the membranes at the os uteri †. This examination, however, must be made with care and

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inevitably happen, as in the latter months (when it is useful,) because the membranes are stronger, when compared to the force which the uterus employs, and adhere less firmly to the uterus.

* In the early months, a separation of the decidua is, from its thickness, almost as dangerous as a detachment of the placenta. But in the end of pregnancy, the disproportion in the size of their vessels, is so great, that a separation of a very small portion of the placenta is much more dangerous than an extensive separation of the decidua, although even this is often attended with alarming bleedings. The two are seldom separated singly; for in most instances, a portion of both is loosened at the same time, or, at least, the one separates soon after the other.

† This distinguishes it from the hemorrhages which are produced by the placenta being placed over the cervix.

delicacy, and only where the bleeding is such as to require an operation; because we might otherwise clear away a coagulum, which was restraining and moderating the hemorrhage. Now as it is a fundamental maxim, that the more the os uteri has dilated, the easier is it to deliver, if the bleeding makes it necessary, it follows, that we ought to avoid, as much as possible, whatever may have a likelihood of obliging us to interfere sooner.

It is a general rule, admitting of very few exceptions, that whenever a separation of the placenta, or membranes, takes place, in the end of gestation, labour is the consequence, if death does not prevent it. Our object, then, is to endeavour to moderate the hemorrhage, as much as possible, so as to allow time for labour to take place, without danger; and when it does begin, to take such steps as shall conduct it most safely, and most speedily, to a conclusion.

When a hemorrhage takes place, from the separation of the placenta, (when it is attached to its proper place,) or of a considerable portion of the decidua, before labour begins, or in the very commencement of it, we must, by absolute rest, and cold applications, endeavour so to lessen the flow of blood as to allow time for the os uteri to relax and dilate, without impairing the strength, by the loss of blood, during the time which this will necessarily require. But if we find that we cannot thus moderate the rapidity of the hemorrhage, so as to permit us to delay interfering until the labour advances so far as to allow of delivery, we must restrain it, by bursting the membranes, and thus lessening the size of the vessels, by diminishing the volume of the uterus. Although this is to be done in every instance where the bleeding continues unabated, yet we ought not officiously to have recourse to it very early, if we can avoid it; because if we pierce the membranes very early, the uterus is apt, for a time, to contract more feebly, and the labour to be longer protracted; on the contrary, opening them at a more advanced period has quite a different effect, and excites brisker action. It is, perhaps, as much by inducing a powerful contraction of the uterus, as by diminishing its volume, and the size of its vessels, that evacuating the waters is useful; because although we remove two pounds of fluid from the cavity of the uterus, we shall still have the diameter of the vessels abundantly large to continue the hemorrhage, unless the fibres contract around them. The propriety then of piercing the membranes, at a time when the action of the uterus is most likely to become brisk, provided this can be done, will readily appear.

By the use of rest, cold, or piercing the membranes, we are almost certain of moderating the bleeding, so as to enable us to wait, with safety, until the os uteri dilates to a considerable degree. After this, one of two things occurs; either the head descends, the uterus contracting briskly round the body of the child, and thus abating the hemorrhage; or, the uterus remains torpid, and the bleeding continues. In this last case, it is only left to us to turn the child, and deliver by the feet; or, should this be impossible, from the advancement of the head, the forceps, vectis, or crotchet, must be used, according to circumstances. These instruments, however, can only be necessary, either when the flooding has not come on until the head has advanced thus far, and when a torpor of the uterus exists, or when, after piercing the membranes, the labour has continued brisk, for a certain time, and then gone off, leaving the vessels unsupported, and at liberty to bleed.

This might indeed be avoided, it may be thought, by turning the child early; but, when hemorrhage does not occur until the head has advanced so far, turning early was out of the question; because we could not foresee the event; and even when flooding does occur early, we may not find it expedient always to turn. Thus, for instance, we may be under the necessity of puncturing the membranes before the os uteri will admit of turning, after which, the labour may go on so safely, that we shall not wish to risk a renewal of the bleeding, by the irritation of turning, but trust to a natural delivery. Sometimes we may be disappointed in our expectation, and the action of the uterus may be suspended, but we can never fail in our ultimate object; because, if the child has descended a certain length, instruments will finish the labour; and, if it has not come so far, the uterus will always admit of turning, when the bleeding is such as to make it requisite. Where the contraction of the uterus prevents this, we can never lose much blood; and, hence, brisk pain is always a favourable circumstance in uterine hemorrhage.

I have purposely omitted mentioning venesection as a mean of moderating the flow of blood in the beginning, because it is a doubtful remedy. We never can be certain, nay, can seldom even entertain the hope of checking uterine hemorrhage, at an advanced period of pregnancy, otherwise than by delivery; and this always must be attended with the loss of a considerable quantity of blood; often as much as the woman can bear to lose without fatal consequences. It would not then be prudent, foreseeing this, to detract blood, especially as in the beginning we may moderate the hemorrhage by other means. If venesection were to be at all useful, it must, in a disease so obstinate as this, be pushed so far as to induce either deliquium, or a state nearly approaching to it. If this be not done, it has no influence on the uterine vessels. Now, every one must admit, that this leaves the patient in such a condition as to render any farther immediate loss of blood extremely dangerous; and, in most cases, the probability is, that a farther loss of blood must be sustained. This, at least, must be the case, unless the separation be very trifling; and we have no criterion, by which we can judge of this, on the first appearance of the hemorrhage.

The practice, then, in uterine hemorrhage, proceeding from a separation of the placenta and membranes, may be reduced to the following rules:

First, Until the os uteri be so far dilated as to admit of turning, we must endeavour to moderate the hemorrhage, by rest, cold, and pledgets introduced into the vagina, in order to promote the formation of coagula. If these do not prove efficacious, or if the bleeding be violent, we must then pierce the membranes[*].

Second, If the hemorrhage still continues, after the labour has advanced so far as to open the os uteri to such a degree as to admit of turning, we must perform this, and deliver the child. But, if the contraction of the uterus has checked the bleeding, and the labour pains are brisk, we may allow the head to come forward, and leave the labour to its natural progress.

Third, If the hemorrhage should again return, from an abatement of the uterine action, we must either push back the head, and bring down the feet, or if this be impossible[†], we must employ the forceps, or even lessen the head of the child, and extract it with the crotchet, if the bleeding be urgent, and the delivery cannot otherwise be accomplished.

It may not be improper, before finishing this subject, to add, that a separation of a portion of the membranes is not always immediately attended with a bleeding; because the rest of the membranes, adhering round the detached portion, may, for a time, confine the blood. Even a part of the placenta may, in this way, be detached without any immediate hemorrhage[‡].

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[*] If the os uteri be firm, and the cervix only distended in part, as in the seventh month, for instance, we must dilate with the finger, or move it gently in until we feel the membranes, and then pierce them. When these hemorrhages come on before labour can be said to have begun, the os uteri is pretty high up; but, when they have continued for a little, the os uteri comes lower down, from the commencement of a contraction of the uterine fibres. Whenever the uterus begins to contract, it also begins to subside, and that whether the labour be in the seventh or the ninth month.

[†] Unless the head be far advanced, it may commonly be returned, if the torpor of the uterus be considerable; but sometimes the womb resists, although it contracts too feebly to prevent hemorrhage.

[‡] The celebrated Albinus mentions a case of this kind, where the whole of the surface of the placenta was detached except its margin.

In these cases it is, occasionally, a considerable time before the hemorrhage appears, the effused blood being retained, distending the uterus to a certain degree. This, at first, produces a dull pain in that part of the uterus where the separation happens; but this very soon becomes more severe, the contraction of the uterus commences, and the clotted blood is first discharged, mixed with that which is still fluid. After this the blood flows in a stream, and the case becomes similar to those already described, both in its nature and treatment.

A flooding is indeed a truly alarming accident, and one of the greatest dangers to which a woman is exposed, either during gestation or labour. But there is no disease more easily understood; and, alarming as it is, the accoucheur can be called to none which more evidently points out its own cure. The discriminating marks of the two great species of floodings * are so easily perceived, and the treatment is so exactly ascertained, that when we hear so frequently of cases where the termination has been fatal, we must ascribe this, not to the fault of our art, or the deficiency of its principles, but to the ignorance or irresolution of him who rashly undertakes to practise it. What shall we think of that man who finds his patient weltering in blood, who, every time he feels the artery, perceives that the powers of life are rapidly declining, who sees death making a near and hasty approach, and yet neglects the necessary examination, and that bold decisive practice, which, in abler hands, might have ensured safety? He has, indeed, good cause to blush, who cannot determine whether his patient bleeds owing to a wrong attachment of the placenta, or a casual separation of that gland, or of the decidua; and he has equal cause to be ashamed, whose humanity would prompt him every mo-

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* Namely, where the flooding proceeds from the insertion of part of the placenta over the os uteri;—and where it proceeds from a casual separation of the decidua, or placenta, when it is attached to its proper place.

ment to give assistance, but whose ignorance prevents him from resolving what to do.

The dead cannot profit by our future diligence; but to become acquainted with the principles of our profession, is surely a duty which all who practise it owe still to the living.

Conclusion.

I cannot finish this subject, without again repeating, that the Anatomy of the Gravid Uterus is the very foundation of the art of midwifery. A knowledge of this is the security of the accoucheur, amidst all the dangers of practice, and his truest guide in every difficult situation. I surely am not saying too much, when I affirm, that every rule of practice, every precept in midwifery, arises solely from the anatomy and physiology of the uterus; and that he who is well acquainted with these points, and possessed of a common share of understanding, to deduce the necessary conclusion from his knowledge, requires no other assistance.

It is not by reading and remembering formal rules alone, that the student, when he comes to practise, is to excel in this department. Cases may very early occur, where these rules will not apply so exactly as he expected, and where all his treasured knowledge will fail. But in no situation can he be at a loss, if well acquainted with the structure and action of the parts concerned in parturition. At all times, he may, from this knowledge, draw unerring advice; and receive, from the very symptoms and appearances which apprize him of danger, such direction as shall enable him fully to acquit himself, and faithfully to discharge that duty which he owes to his patient.

FINIS.

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